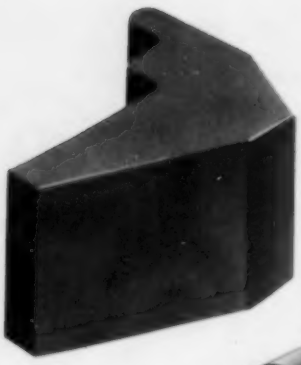
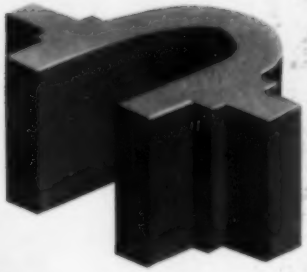
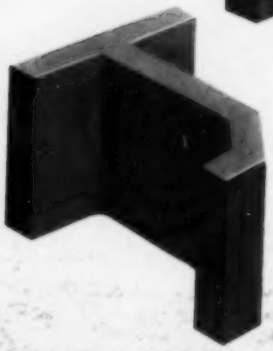
MAY 9, 1955

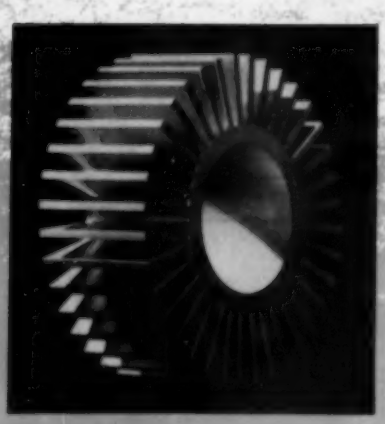
STEEL

The Metalworking Weekly









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Made-to-measure economy

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✔ Warehouses Adapt to Markets
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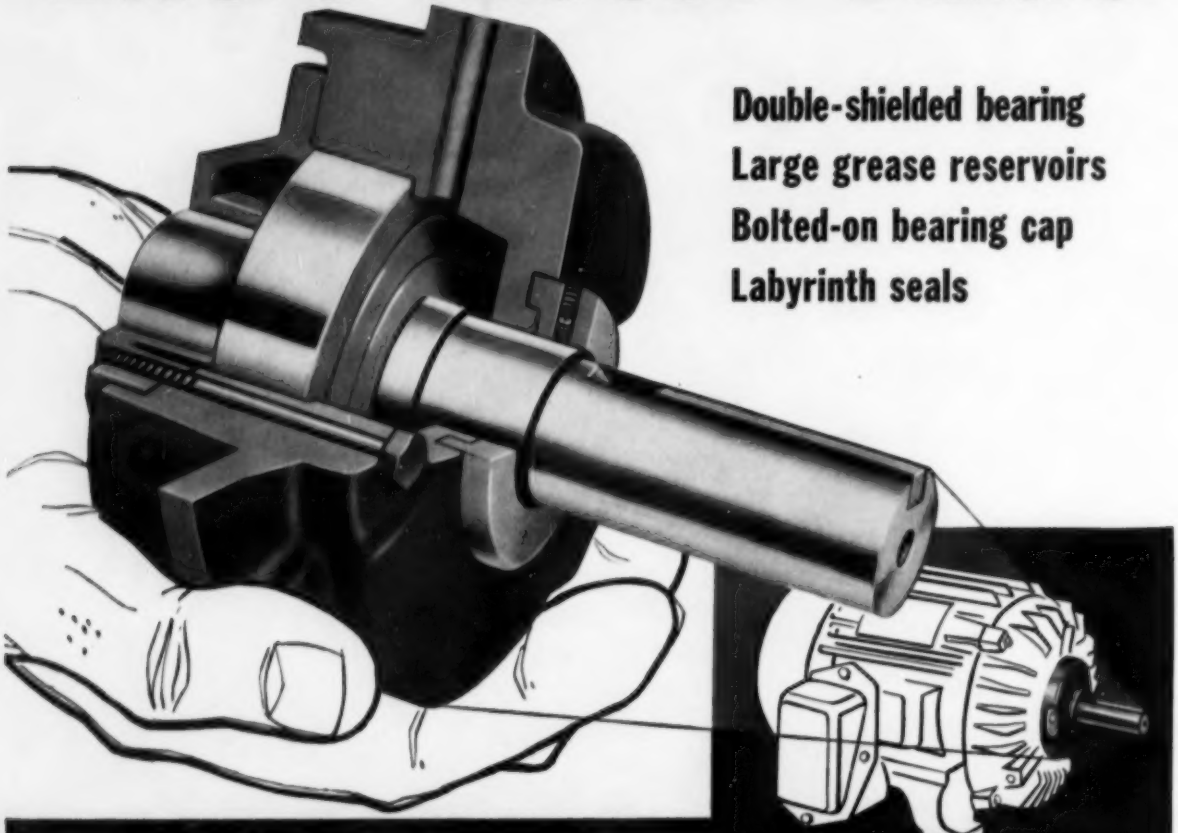
Here Is Extra Motor Value



Double-shielded bearing
Large grease reservoirs
Bolted-on bearing cap
Labyrinth seals

This Allis-Chalmers Bearing Design Gives More for Your Motor Dollar

The bearing cap is held tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure.

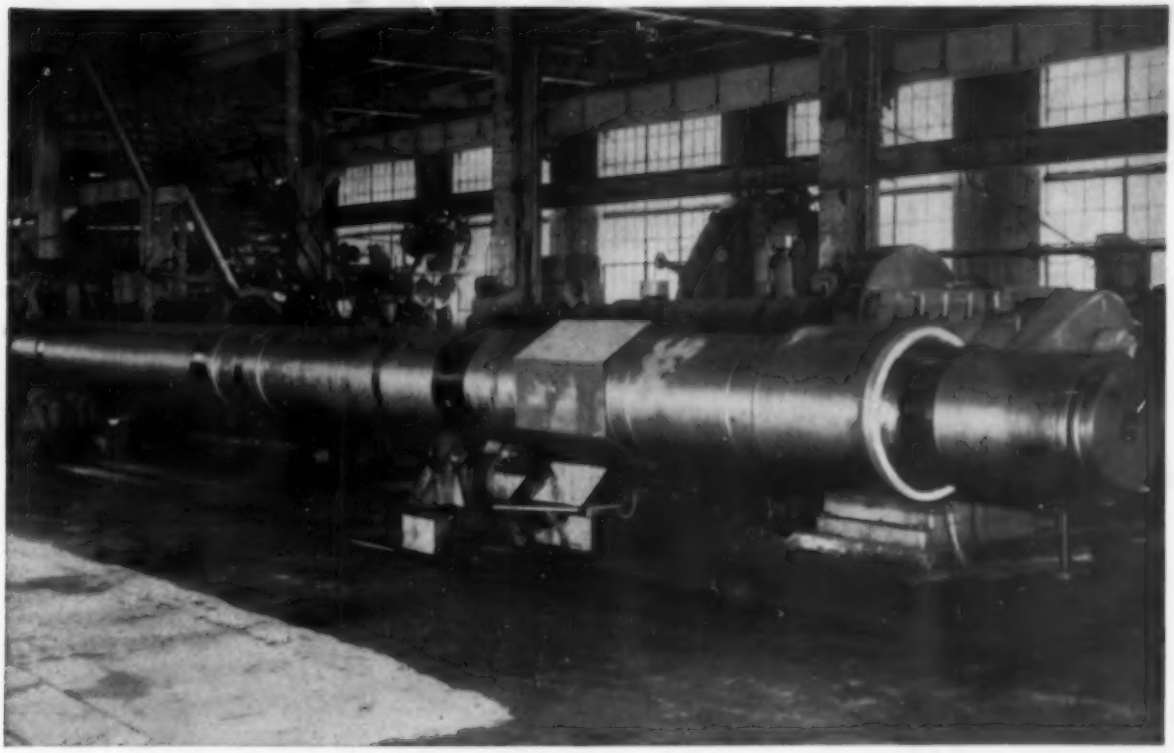
At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

You can lubricate these bearings without dismantling motor. Pipe-tapped holes in the bearing housings at two points provide means for inserting new grease, flushing out old grease and of relieving pressure during re-greasing.

Look for the extra bolts on the end housing . . . the sign of greater value. Ask your Allis-Chalmers representative or Authorized Distributor to show you a cutaway section of this maintenance-cutting design. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7225.

A-4616

ALLIS-CHALMERS



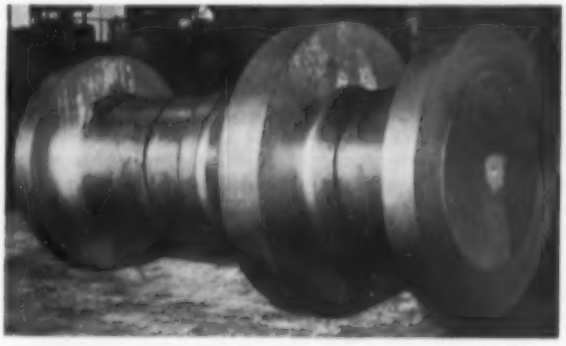
Forged-steel shaft weighs 42 tons; will be used in mine hoist

Above is an interesting carbon-steel forging that is destined to become the shaft for a large mine hoist. As you can imagine, a tremendous amount of work had gone into it before the photograph was taken. The piece was forged, heat-treated, rough-machined, and smooth-bored in the Bethlehem shops, and as you see it here, it weighs in excess of 42 tons. It is 43 ft, 8 in. long.

Forgings like this require special facilities, and Bethlehem has them. We can readily turn out pieces that run a hundred tons or more. On the other hand, we are equally well prepared to produce much lighter items, such as the forging shown in the smaller picture. That one, a thrust shaft, doesn't weigh a full nine tons.

Shafts, of course, are but one of the many types of forgings that Bethlehem makes each year. Through our shops pass everything from giant steel columns to little drop forgings that you can hold in one hand. Whenever you need a forged product of any size, type, or weight, Bethlehem is fully prepared to make it for you and offer a good delivery date.

And please remember, too, that we are always set up to rough- or finish-machine — to your exact specifications.



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

7 WAYS to SAVE MONEY with TOCCO* Induction Hardening

Cost was reduced 94% when heat-treatment of this corn-harvester part was changed from carburizing to TOCCO-hardening, 9½c saved on every piece — $4750 on each 50,000 piece batch, plus an hourly production increase from 120 to 300 pieces per hour.

$375 per day! When Salisbury Axle switched to TOCCO-hardening axle shafts. Less machining—30 seconds instead of 2 minutes—means lower tool cost. Also production zoomed from 50 to 120 per hour. TOCCO hardened shafts have 200% greater torsional life.

Kearney & Trecker Corp. reduced the cost of hardening this milling machine part from $1.57 to 10c apiece. In addition TOCCO made possible a switch from alloy to S.A.E. 1045 steel—saving another 11c per piece in material cost. Kearney & Trecker hardens 140 different parts on one TOCCO unit.

Thompson Products Ltd. boosted production of these automotive wrist pins from 500 to 1200 per hour when they switched to TOCCO-hardening. Costs fell from $5.45 to $3.25 per hundred parts—a savings of 2c per pin, $26.40 per production hour.

Mechanics Universal Joint Division of Borg-Warner reports a 69% savings in the hardening of stub ends for propeller shafts. TOCCO also upped production from 35 to 112 parts per hour—over three times as fast as conventional heating methods.

Lima-Hamilton Corporation adopted TOCCO for hardening this shifting lever. Results: a savings of 4c per piece—$25 per production hour. TOCCO costs only 17% of former heating method. This is only 1 of 139 parts TOCCO-hardened by Lima-Hamilton Corp. All show savings over usual heating methods.

7 Number 7—the lucky number—is up to you. Why not add your name to the list of companies who use TOCCO Induction Heating to increase production, improve products and lower costs. TOCCO engineers are ready to survey your plant for similar cost-saving results—without obligation, of course.

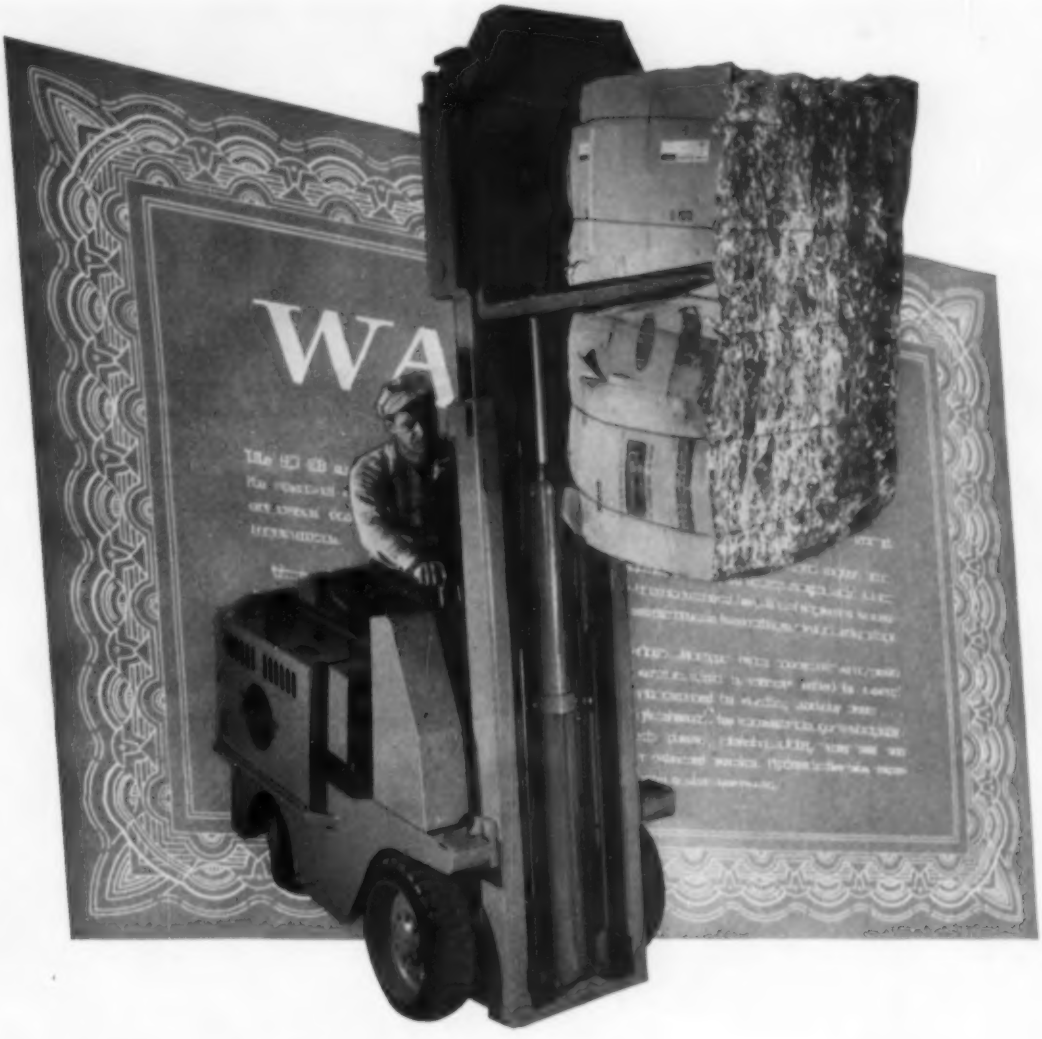
THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-5, Cleveland 1, Ohio
Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating."

Name_____
Position_____
Company_____
Address_____
City_____ Zone____ State_____



Insist on a...

ONE YEAR WARRANTY

when you buy an electric fork truck

All Baker battery-powered industrial trucks—including fork, platform, crane trucks and tractors—are warranted against defects for a full year from date of shipment.

As a truck purchaser, you should accept nothing less.

A one-year warranty assures you that the manufacturer has complete confidence in the materials and workmanship that go into his product. It gives you twelve months protected operation of the truck *under your conditions*—allowing ample time to detect imperfections, which might not show up during a 30, 60 or 90 day guarantee period.

Baker Trucks have a half-century reputation for outstanding performance, long life and low maintenance. For example: a fleet of the first Baker ram trucks ever built is still in service at a large midwestern steel mill after 32 years!

Let a Baker handling engineer give you the full story, or write for Bulletin 54B. The Baker-Raulang Company, 1259 West 80th Street, Cleveland 2, Ohio.

Baker.
handling equipment

582

This Magnetic Counter

Adds and Subtracts

Added Evidence that —

Everyone Can Count on VEEDER-ROOT

Flip the switch up . . . the counter adds. Flip it down . . . it *subtracts*. And this 2-way countability makes this new counter a distinct asset to modern systems of automation, control engineering and stock control. Readily adaptable, easily installed and connected to existing circuits, the Veeder-Root "plus or minus" counter is a reliable double-check on the operation of machines, processes, systems. And it's just one of scores of standard and special Veeder-Root Counters for every field of reckoning from atomics to electronics to automation. What is *your* counting problem? Let's put a mathematical eye on it . . . write:

VEEDER-ROOT INCORPORATED
HARTFORD 2, CONNECTICUT

Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C.
Montreal 2, Canada • Dundee, Scotland
Offices and Agents in Principal Cities

"The Name that Counts"

STEEL
The Metalworking Weekly

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A MARK to Remember

For over three quarters of a century, the Seymour trade mark has been a symbol for the finest quality NICKEL SILVER — PHOSPHOR BRONZE — BRASS — NICKEL ANODES — BRIGHT NICKEL PROCESSES — WELDING RODS and other non-ferrous products.

It has also been a symbol for Seymour SERVICES — speedy, same-day acknowledgment of orders and inquiries — expert engineering and metallurgical help in selecting and specifying non-ferrous metals for special applications.

Fine, dependable products and fast, friendly service . . . these are the qualities which have made the Seymour sunburst a trade mark to remember.

In the months ahead you will see and hear a lot more about Seymour and the products it manufactures. The news will come from Seymour distributors and Seymour representatives.
Watch for it. Listen for it.
MARK IT WELL!

THE SEYMOUR MFG. CO.
500 FRANKLIN STREET
SEYMOUR, CONN.
NEW YORK SALES OFFICE:
CHANIN BUILDING — CABLE, SEYMOURCO

NOW TWO TYPES OF CHALLENGE SURFACE PLATES

NEW! CLOVIS BLACK GRANITE
Rated Class A.
Surface accuracy guaranteed.

FINE GRAIN SPECIAL ANALYSIS SEMI-STEEL
Precision ground or hand-scraped

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786

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THE CHALLENGE MACHINERY CO.
Office, Factories and Show Room:
GRAND HAVEN, MICH.

behind the scenes

Solemn Pride

STEEL's editors get a lot of satisfaction out of helping and informing the metalworking world. One measure is the letters they get from you, their readers. They were particularly impressed by a cordial letter from Joe Oberle, supervising metallurgist, Research Dept., Caterpillar Tractor Co., Peoria, Ill. Mr. Oberle took the trouble to compliment STEEL's Technical Editor Dr. Allen Gray on the publication of the Hardness Conversion Nomograph (STEEL, Jan. 10), calling it " . . . another of the many services your magazine has rendered the metallurgical field."

Beyond that, Mr. Oberle incorporated the nomograph into some sort of circular slide rule, which is laminated in transparent plastic and marked with rules for quick identification. "While the present device is crude," Mr. Oberle wrote, "it has served the purpose quite satisfactorily, and the idea may be worth-while passing along to others. Some company may want to use it as an advertising device. Since your publication first reproduced the nomograph, we submit the model to you for whatever use or publicity you may wish to give it. Our thanks again for many services you have rendered, and our best wishes for the future."

Helpful Heating

Other evidence, currently stacked high in the form of letters on Editor Irwin Such's desk, reveals that STEEL's Modern Heat Treating Series (prepared by Dr. Gray) is creating something of a sensation. Judged by 1954 standards, heat treating can trim costs and maintain and improve product quality. Industrial heat treating technology has come up faster during the last few years then most manufacturers realize. STEEL is presenting the series to help management men take advantage of the cost-cutting potential inherent in modern heat treating.

In connection with the article that appeared Apr. 11, "Vacuum Heat Treating," a waggish reporter observed that if metal were improved in a vacuum, it would be a case of good from nothing.

While we're on the subject of heat treating and tempering, we should pause a moment in solemn contemplation of the early slaves who helped temper Saracen swords. It is written in history books that Saracen metallurgists obtained superior swords by heating them properly, and then quenching the heated weapons in pot-bellied slaves. The only moral we can infer from this is that the next time you think you have a burning pain in your stomach, you just *think* you have, brother!

Meet Raymond

Don Horwitz, the indefatigable genius of U. S. Bedding Co., St. Paul, sent in the first correct answer to the anagram puzzle: 1,578,528,000. The equally unstumpable Max Bailey, Machine Products Corp., Montreal, Que., sent an answer that lacked the final zero, but we assume it was a typographic error.

How about this one: Here is a number, which we will call Raymond. It is made up of three digits (from left to right) named Jean, Baptiste and Achille. The sum of Jean, Baptiste and Achille is identical with Jean Baptiste, while the sum of Jean and Baptiste equals Achille. What number does Raymond impersonate?

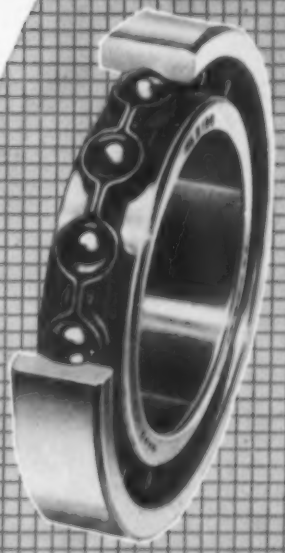
Shrdlu

(Metalworking Outlook—Page 39)

Nuts and Bolts...

Tightening and removing 5" diameter nuts and 3¼" diameter bolts on a 115,000 HP Hydro-Generator! A rugged task, but this rugged Air Impactool is equal to it! And, like so many hard-working tools, it uses hard-working anti-friction bearings. Federal Ball Bearings, of course!

Ingersoll-Rand



so much of industry *turns* on FEDERAL ball bearings

On tough jobs or rough roads... in the machine shop, office or on the farm. Wherever anti-friction problems need to be solved—that's where you'll find Federal Ball Bearings at work. There are hundreds of types—12,000 sizes—and they're produced by a 50-year-old manufacturer of ball bearings *exclusively!*

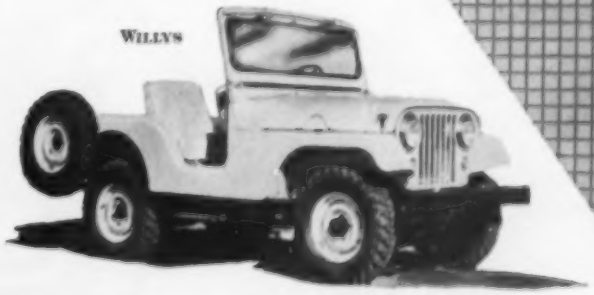
When Federal Ball Bearings are part of so many things you *use*, shouldn't they be part of the things you *make?*

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, N. Y.

Latest ball bearing and engineering data! Full 175 pages of it—in FEDERAL'S *NEW* CATALOG! Just speed us your request and we'll speed you back your copy!

or Ruts and Jolts...

Our old friend the Jeep—new CJ model. As ever; daring, dependable, durable—on the road or off! It, too, is served by reliable Federal Ball Bearings—doing their anti-friction job in the gear transmission.



Federal BALL BEARINGS

One of America's Largest Ball Bearing Manufacturers

RUGGED PRESSES

DESIGNED BY BLISS

FOR THE AGE OF AUTOMATION

Bliss "packaged presses," built to JIC standards, offer advantages like these

- All piping and wiring for press controls, automatic work-handling devices and maintenance tool power outlets are *built into the uprights.*
- Cuts installation time and cost—practically all the installation crew has to do with the press is "plug it in".
- Eliminates split responsibility for press performance—centers it instead on the press builder.
- Simplifies installation and maintenance of dopers, cushions, lifters, Iron Hands and other work-handling devices.
- Leaves clean, uncluttered exterior—cranes can move up close to load or unload dies without bumping or snagging.

FOR MORE INFORMATION, WRITE

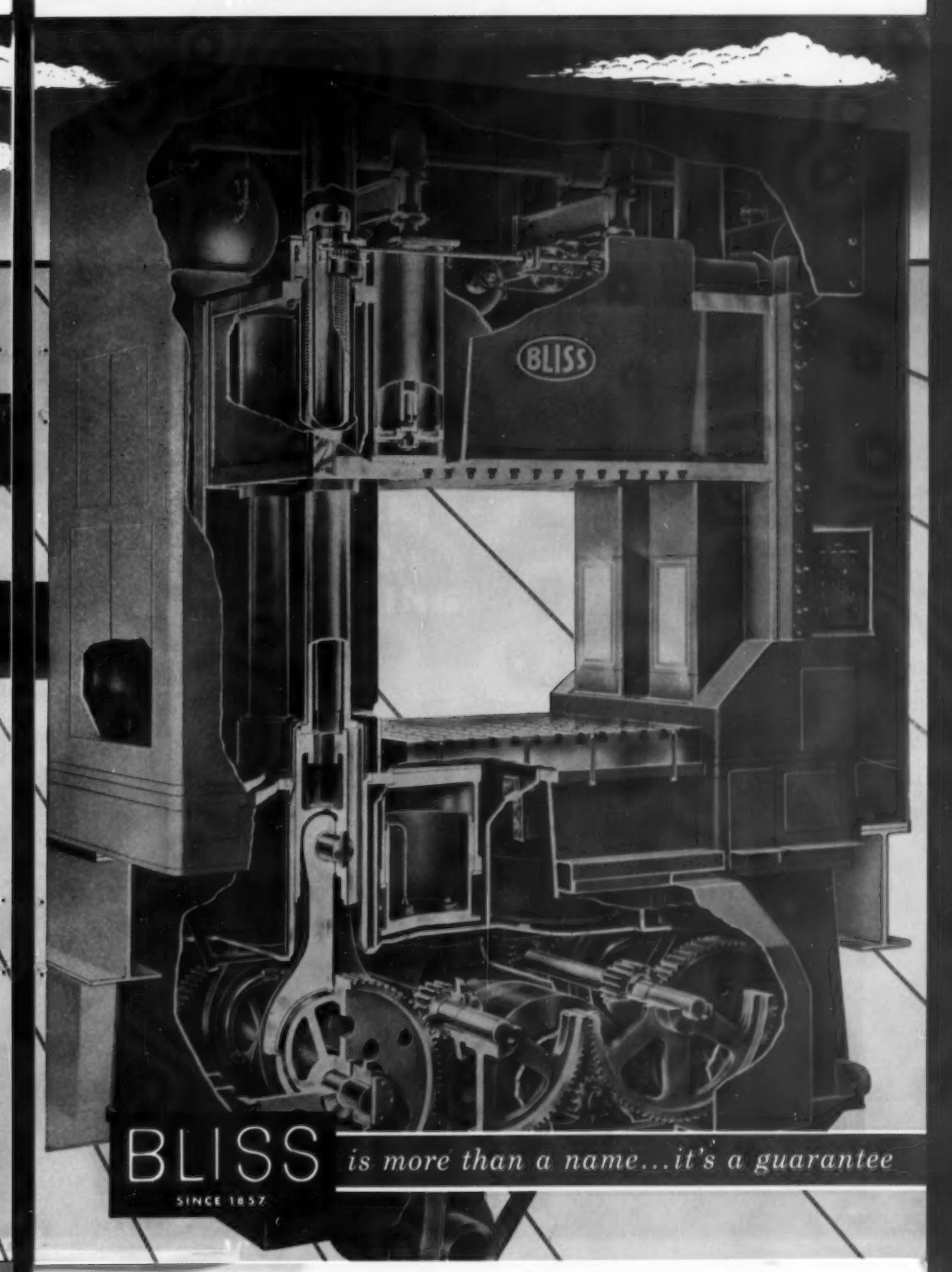
E. W. BLISS COMPANY, Canton, Ohio

Presses, Rolling Mills, Special Machinery

U. S. Plants in Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; San Jose, Calif. Representatives in principal cities.

Beneath the sleek exteriors are these new design features—

- Heavy frame construction—For a century, Bliss has been known for its emphasis on heavy frames. With big presses like these, Bliss' heavy sections and internal ribbing easily take quick shock loads in stride.
- Extra-long gibbing—slide works entirely within gibs, even when adjustment is down. Motorized slide adjustment is self-braking, assures accurate positioning. Slide runs true at all times, meaning longer die life and greater accuracy.
- Integral gear and eccentric drive—its compactness allows gears to operate within the crown. No overhanging gear guards. And Bliss' design eliminates torsional deflection of main pin, minimizes distortions due to overloads.
- New automatic lubricating system—a recirculating type which has proved foolproof in service. Positive piston displacement method automatically lubricates every bearing surface at predetermined intervals. Electrical interlocks shut down press if a single feeder fails.
- Cool-running high speed clutch—Bliss' combination pneumatic friction clutch and brake is extremely fast—only a fraction of an inch needed between full engagement and brake. Self-aligning feature automatically compensates for wear. Clutch is also self-cooling.



BLISS

SINCE 1857

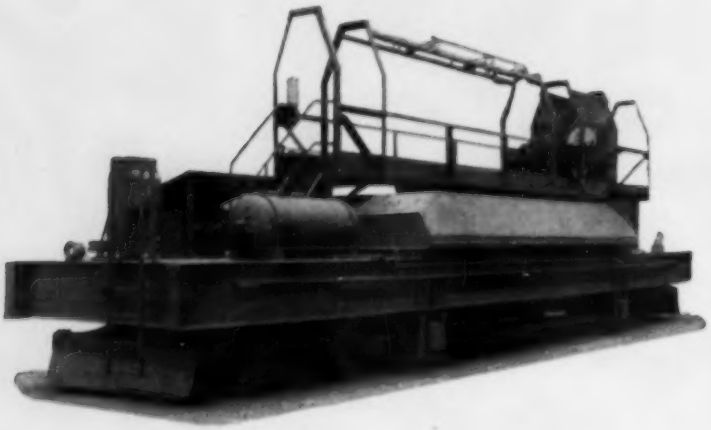
is more than a name...it's a guarantee

STOCK HOUSE OR HIGH LINE

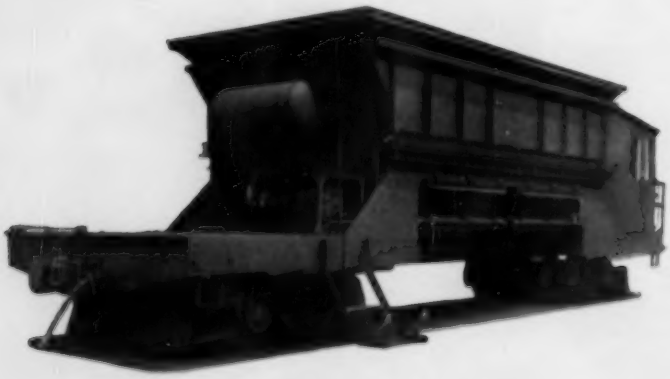
operators prefer the

DEPENDABILITY OF ATLAS CARS

These specially designed units are another example of the ruggedness of Atlas Cars. Their dependability helps maintain the most rigid furnace charging cycles.



40-TON SCALE CAR
Double Hopper Bottom Dump



75-TON ORE TRANSFER
Gable Bottom Double Side Dump

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS
1140 IVANHOE RD. • CLEVELAND 10, OHIO, U. S. A.

LETTERS
TO THE EDITORS

No Such Tables

Are tables available which give the machinability of A.I.S.I. series and AMS series steel, in both the annealed and heat-treated conditions (Rockwell C-20 to C-45, in intervals of 5 points)?

J. Weistner
assistant engineer
Quaker City Gear Works Inc.
Bethayres, Pa.

• *To our knowledge, such tables are not available. We are forwarding the article, "It's Faster Than You Think" (Aug. 30, 1954, page 64). It includes an up-to-date table on cutting speed numbers for steel and cast iron which may be of value.—ED.*

Plant Prognostication

Your article, "Better Plant Layout" (Apr. 18, page 93), was most interesting and informative. We feel that considerable benefit can be gained through greater circulation of this article in our plant. I would appreciate receiving three copies.

J. C. Kice
methods engineer
Arlington Plant
General Motors Corp.
Arlington, Tex.

Please send two copies of your excellent article . . .

K. C. Pyne
supervisor, plant engineering
Lehigh Structural Steel Co.
Allentown, Pa.

This third article in the Program for Management, 1955 series, was outstanding. Please forward three copies.

Christopher J. Reiley
industrial engineer
The Patent Button Co.
Waterbury, Conn.

• *Sent.—ED.*

Iron and Steel Research

I am writing a research paper on the iron and steel industry. Do you have any material on steel demand, future growth and sales in the industry or profits to be derived from steel making?

Harold J. Dolato
959 N. 14th St.
Milwaukee

• *Being forwarded are: The 30th Annual Financial Analysis of the Steel Industry (insert in Apr. 11 issue); the Market Outlook of Mar. 28 (page 121); and "Coming: Another Wave of Steel Expansion" (Sept. 20, 1954, page 111).—ED.*

Valuable Assistance

Last year this office received reprints of your 1953 Program for Management series (which were helpful to our management team). Inadvertently we failed to request reprints of the 1954 series. If any are left, may we have a set? We of the purchasing office and our friends in engineering and production would lose valuable as-

(Please turn to page 12)

Here's the inside story

of cost-cutting

ROCKRITE CYLINDER TUBING

The inside surface is entirely free of scoring, is so smooth and has such a low RMS rating it is ideal for pneumatic cylinders. Just cut it in desired lengths and use as is for soft-packing pistons. Save the cost of inside machining or honing. And save too by complete standardization of parts that Rockrite close tolerances make possible.

For details ask for Bulletin R7.

ROCKRITE TUBING

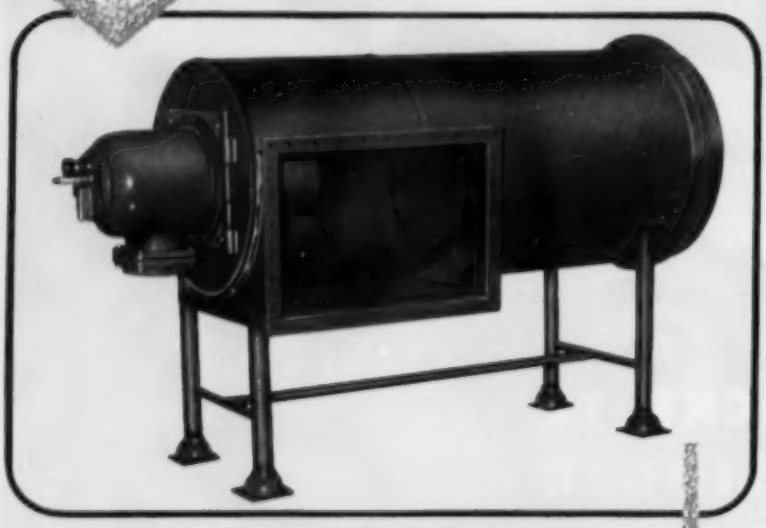
TUBE REDUCING CORP.

WALLINGTON, NEW JERSEY

SUBSIDIARY OF AMERICAN METAL PRODUCTS CO

JOSEPH T. RYERSON & SON, INC., NATIONAL WAREHOUSE DISTRIBUTORS

THERMAL TYPE CA DIRECT FIRED AIR HEATERS



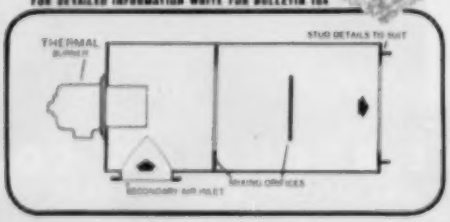
COMPACT . . . EASILY INSTALLED

Readily fitted to ovens, kilns, spray dryers, etc., the THERMAL Type CA Air Heater is an ideal source of heat where products of combustion may be mixed with the air. Oil, gas or combination firing is available without change in heater construction.

NO REFRACTORY REQUIRED . . .

The THERMAL High Velocity Burner built into the heater permits combustion to be substantially completed within the burner itself. Thus the heater is basically a mixing chamber wherein the products of combustion are mixed with the air being heated. Refractory is not normally used. Successful applications have been made ranging from under 200,000 BTU/hr. to over 20,000,000 BTU/hr. and at all pressure levels.

FOR DETAILED INFORMATION WRITE FOR BULLETIN 104



UNITIZED CONSTRUCTION

Initial cost and upkeep is kept at a minimum through the use of all welded, all metal construction. The CA Air Heaters are normally supplied as complete "package" installations.

OTHER THERMAL PRODUCTS & SERVICES — Gas, Oil & Combination Gas-Oil Burners • Heat Exchangers • Submerged Combustion • Combustion & Heat Transfer Engineering

THERMAL

Thermal Research & Engineering Corp.

CONSHOHOCKEN • PENNSYLVANIA

REPRESENTATIVES IN PRINCIPAL CITIES

LETTERS

(Concluded from page 10)

sistance if deprived of our weekly copy of STEEL.

Andrew J. Wood
contracting officer
Purchasing Branch, MSO
Red River Arsenal
Texarkana, Tex

• *Sent.—ED.*

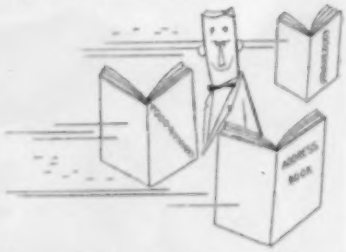
Aid to Engineers

The article, "Opportunity Knocks in the Micron Range" (Apr. 11, page 108) is outstanding. It helps our engineers evaluate fabricating methods and properties. We would appreciate three reprints.

J. F. Kuhns
project director
Mills, Petticord & Mills and Associates
Washington

• *Sent.—ED.*

May I Have the Source?



You mention diamond mounting in the Technical Outlook column of Apr. 4 (page 77). I would like more details on this. May I have the source of the information?

W. F. Parsons
technical correspondent
Product Service Dept., A.E.B.
Carborundum Co.
Niagara Falls, N. Y.

• *Write H. Tracy Hall, Research Laboratory, General Electric Co., Schenectady, N. Y.—ED.*

Who has developed the ultrasonic attenuation analyzer described in the article, "Fatigue Draws Its Picture" (Apr. 18, page 127)? It might be of some use to us.

M. L. Frey
assistant to gen. works mgr.
Tractor Division
Allis-Chalmers Mfg. Co.
Milwaukee

• *The producer is Vibro-Ceramics Corp., a Gulton Industries affiliate, Metuchen, N. J.—ED.*

I am interested in obtaining data on the porcelainized aluminum name plates being used by aircraft manufacturers. This is described in the Technical Outlook column of Apr. 4 (page 77).

Carl Halpern
vice president
Electro-Chemical Engraving Co. Inc.
New York

• *Contact the California Metal Engraving Co., 6904 E. Slauson Ave., Los Angeles 22, Calif.—ED.*

In the Apr. 18 Technical Outlook column (page 103) is an item on three-dimensional stress analysis (making it possible to determine stresses deep in the interior of a body). Where can I get further information?

Jos. L. Gilman Jr.
consulting engineer
412 Albee Bldg.
Washington

• *Write Miss Mildred Wyatt, Technological Center, Illinois Institute of Technology, 35 W. 33rd St., Chicago 16, Ill.—ED.*

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Customer-loyalty is mostly good business sense. And that's why so many makers of quality merchandise stay with American Phillips year in and year out . . . why a furniture-builder and an organ-maker, for instance, have been standardized on this modern fastening method ever since American first introduced the Phillips Screw to industry.

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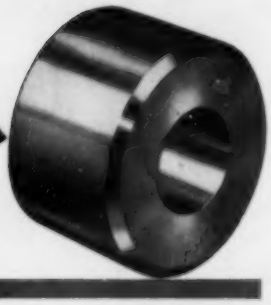

You get demonstration of your work and complete job development record

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Cone makes recommendations

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The use of carbide setups on Conomatics is moving along so rapidly that it is just good business to make very certain that your next multiple spindle automatics will meet 100% carbide tool requirements.

You can be certain by seeing a demonstration of the machine of your choice equipped with carbide tools on your own work. That is, you can if it is a Conomatic.

Without charge, except for bar stock and tools, you can be an on-the-job witness to a carbide test run of your own work on a Conomatic.

And whether you are ready for carbide now, or will be later, you will want to consider a machine that is superior for either carbide or hss.

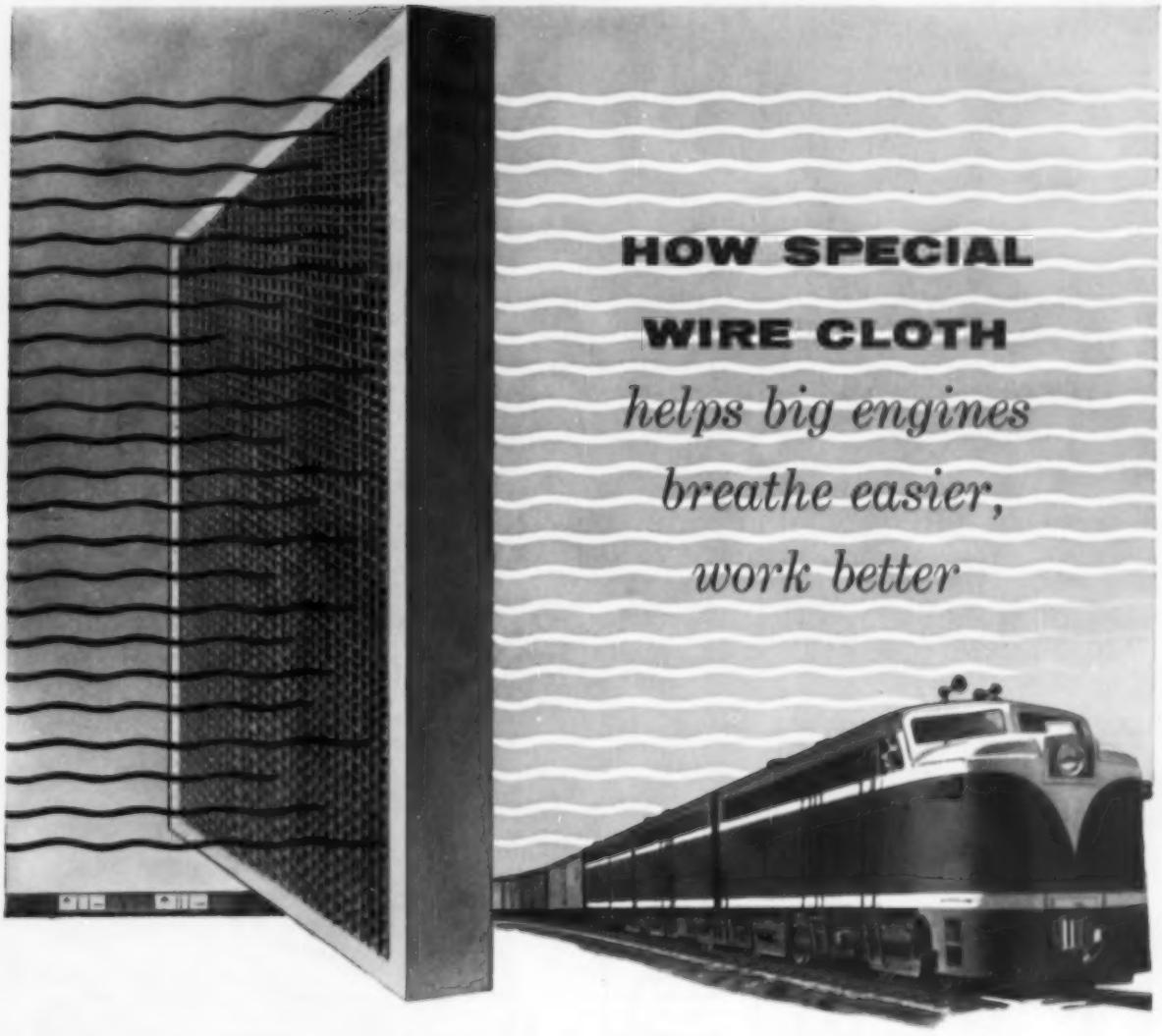
DATA FOR COMPARISON

Part ..... Roll	Depth Hole..... 1 1/32"
Machine.. 1 5/8" Six Spindle Conomatic	Work Dia..... 1 9/16"
Material..... 8620 HR	Drill Dia..... 1 1/16"
Tools..... 100% Carbide Tipped	RPM..... 1216 Work Spindle 1040 Op. Drill 2256 Total Eff'd.
Stock Size..... 1 5/8"	
Length..... 1 1/32"	Time..... 10.7 Seconds

Conomatic

For particulars send for "Four Steps With Cone"

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.



● Keeping harmful grit and dirt out of the lungs of big engines, like locomotive diesels, is no small problem. Determined to do the job better than ever before, a leading filter manufacturer turned to the *Reynolds Wire Division* of National-Standard for a special wire cloth that would trap all the dirt and still let such engines breathe the terrific volume of air they need.

No simple assignment this, for it took months of concentrated development work—not only to develop the *kind* of wire cloth that would do the job, but also to find out *how best* to produce it. It had to be slit into narrow widths, with special lock wires to prevent raveling. It had to withstand a patented method of severe forming and crimping without compacting. And despite the special construction and narrow slitting, it had to be furnished in extra large continuous rolls. All were tough problems to lick!

The *ability* to lick a tough problem in wire cloth is one thing. The *willingness* to do it is quite another. You get *both* at Reynolds Wire. But, problem or no problem, short orders or large volume production, you too will find it pays to turn to Reynolds. Try us and see.

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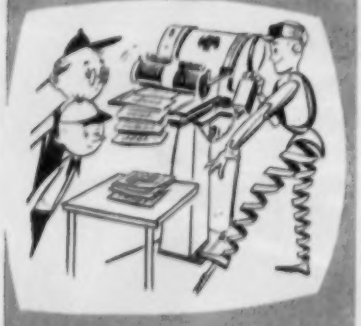
MARKED IMPROVEMENT
In PAYROLL and PRODUCTION TAGS



Stocking huge pre-printed inventories of piecework, production and payroll tags —then hand stamping or writing the entries—is about as costly and tedious a method as you could find. Markem's 32A machine shown does the job far faster, cheaper and easier. Whatever you wish to mark—product, part or package —most likely there's a Markem machine, type and ink specially suited to the job. Whether you have a real marking "problem"—or would just like to improve on your present method—we'd like to talk with you. Write us now. Markem Machine Co., Keene 30, New Hampshire.

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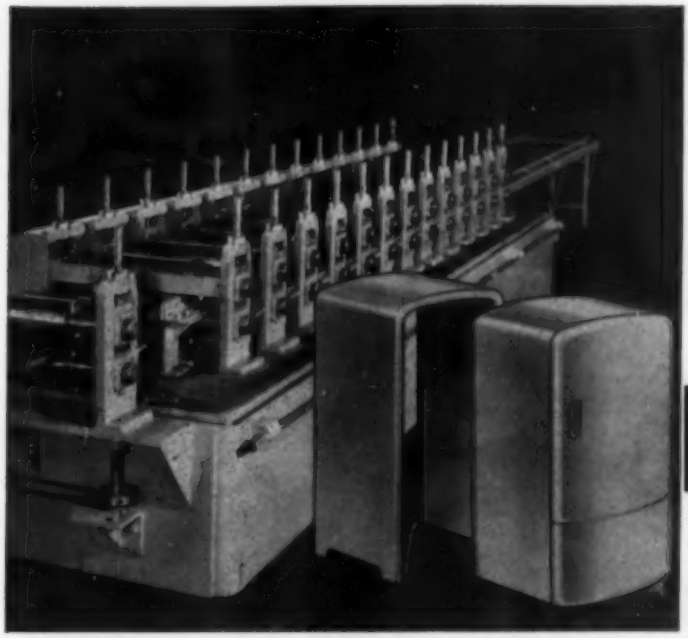

Refrigerator shells now being made almost exclusively in Yoder Cold Roll Forming machines, from flat sheets forming sides and top.

In autos, buses and railroad coaches, cold roll formed mouldings and panels serve many purposes, both inside and out.

Cold Roll Formed components enter extensively into this Stransteel home and many other factory-built structures.

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K21 is designed for cutting stainless steels, nickel steels, heat-resistant alloys, and high tensile alloy steels.

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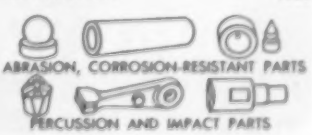

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2ND PRIZE $250 **3RD PRIZE $100**

Make your redesign ideas pay off in cash! You are eligible if you have redesigned a product or part for production in gray iron which economically and efficiently replaced a competitive material. Regardless of how simple or complex your entry may be, you have a good chance of winning.

FOLLOW THESE EASY CONTEST RULES

1. Select the best example of products or parts that you have redesigned for production in gray iron.
2. Give all facts leading up to your redesign . . . why you thought of gray iron . . . how much was saved in labor and/or material costs . . . how much efficiency was gained and any other factors leading to your decision.
3. Submit an 8″ x 10″ glossy photo of the gray iron casting with your entry. If possible, also submit a similar photo of the original design.
4. Your entry must be in the mail by July 1, 1955 the contest closing date. Address: Redesign Contest, Gray Iron Founders' Society, Inc., National City-E. 6th Bldg., Cleveland 14, Ohio.
5. Contest is open to all persons engaged in the metal-working trades . . . entries may be made jointly by two or more individuals. Awards will be made at the 27th annual meeting of the Society in Milwaukee, Oct. 21, 1955.

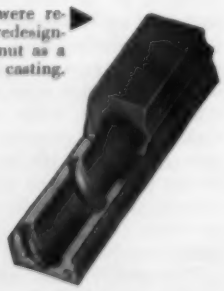
These examples of previous award winners show how easy it is to be a winner yourself . . .

Make it better with Gray Iron

22 parts were eliminated when the fabricated design of this hydraulic circuit was redesigned in gray iron.

Redesigning this table top in gray iron saved 15 hours in production time.

Original costs were reduced 83% by redesigning this screw nut as a cored gray iron casting.



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The Ansul dry chemical fire equipment pictured above includes portable hand units, wheeled and stationary units and a jeep installation. Ansul also manufactures automatic dry chemical piped systems, custom engineered for the hazard. Ansul equipment is listed and approved by Underwriters' and Factory Mutual Laboratories.

Only Ansul offers a Five Year Equipment Warranty

Your assurance of fast, dependable fire protection

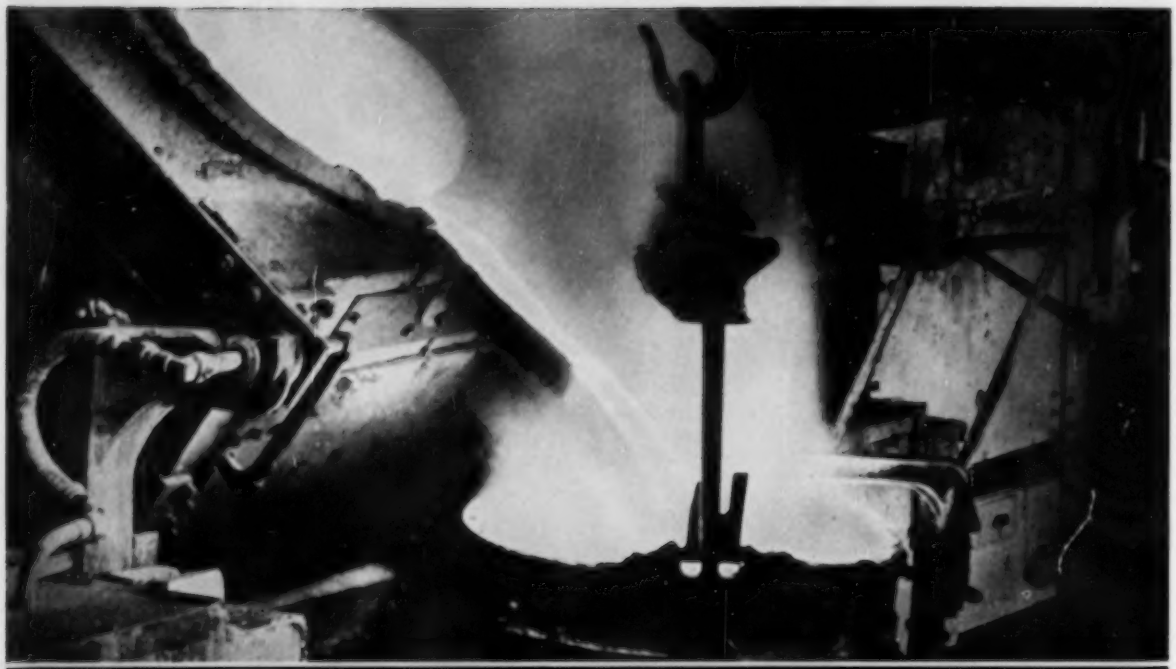
For you, the buyer of fire equipment, Ansul's important 5 year warranty means many extra years of fast, dependable protection. It also means freedom from costly maintenance checks and repairs.

Special design and construction features make this warranty possible. Ansul's *weather-tight* construction keeps out moisture, resists corrosion. *Patented nozzles* deliver the right kind of stream for your hazard. A *sealed pressure cartridge* puts Ansul's "Plus Fifty" dry chemical to work immediately—no delay or lag. Finally, *rugged construction* makes it possible for Ansul equipment to give peak performance under the toughest operating conditions.

Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Division, Dept. F-133, Marinette, Wisconsin. *Write Ansul for your copy of new Fire Equipment Catalog.*

ANSUL



6 tons of steel melted and poured every 2½ hours

SPEED . . . CONTROLLED QUALITY . . . ECONOMY —these advantages are enjoyed on every melt, ferrous or non-ferrous, in Ajax-Northrup induction furnaces. This furnace for example, turns out a six-ton charge of nickel alloy—precisely alloyed and virtually free of impurities—every 2½ hours.

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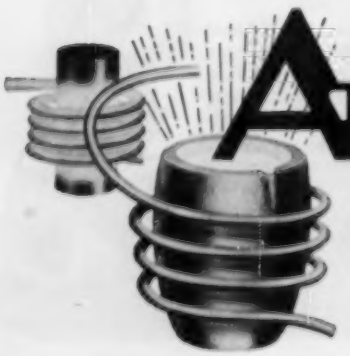
Ajax has been building induction furnaces for all metals since 1916. Installations capable of producing up to 20,000 pounds of metal per hour are in operation, and more and more foundries are switching to Ajax-Northrup melting as they discover its economy and advantages. Learn why in Bulletin 27-B, available upon request to Ajax Electrothermic Corporation, Trenton 5, New Jersey.

Associated Companies: Ajax Electric Company—Ajax Electric Furnace Co.—Ajax Engineering Corp.



AJAX NORTHRUP SINCE 1916

INDUCTION HEATING-MELTING

CALENDAR
OF MEETINGS

May 8-11, Automotive Engine Rebuilders Association: Annual meeting, Hotel Cleveland, Cleveland. Association's address: 419 N. Capitol Ave., Indianapolis 4, Ind. Executive vice president: R. G. Patterson.

May 8-11, National Industrial Advertisers Association: Annual meeting, Sheraton Park hotel, Washington. Association's address: 1776 Broadway, New York 19, N. Y. Executive secretary: Blaine G. Wiley.

May 9-11, Metal Treating Institute: Spring meeting, Ambassador hotel, Los Angeles. Institute's address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

May 10-13, Metal Powder Association: Annual meeting and exhibit, Bellevue-Stratford hotel, Philadelphia. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: Robert L. Ziegfeld.

May 11-13, National Association of Sheet Metal Distributors: Spring meeting, Hotel Cleveland, Cleveland. Association's address: 1900 Arch St., Philadelphia 3, Pa. Secretary: Thomas A. Fernley Jr.

May 15-18, Copper & Brass Research Association: Annual meeting, the Homestead, Hot Springs, Va. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: F. L. Riggin Sr.

May 15-18, Industrial Heating Equipment Association Inc.: Spring meeting, the Homestead, Hot Springs, Va. Association's address: 412 Fifth St. N.W., Washington, D. C. Executive vice president: Carl L. Ipsen.

May 16-17, American Management Association: Special conference on collective bargaining, Commodore hotel, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

May 16-19, American Mining Congress: Coal convention and exposition, Cleveland Public Auditorium, Cleveland. Congress' address: 1102 Ring Bldg., Washington 6, D. C. Executive vice president: Julian D. Conover.

May 16-20, Materials Handling Exposition & Conference: International Amphitheatre, Chicago. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N. Y.

May 18-20, Porcelain Enamel Institute: Mid-year division conference, Edgewater Beach hotel, Chicago. Institute's address: 1346 Connecticut Ave. N. W., Washington, D. C. Secretary: John C. Oliver.

May 19-20, National Industrial Conference Board Inc.: General session for all associations and 39th annual meeting, Waldorf-Astoria hotel, New York. Board's address: 247 Park Ave., New York 17, N. Y. Secretary: Herbert S. Briggs.

May 19-20, Refractories Institute: Annual meeting, Cavalier hotel, Virginia Beach, Va. Institute's address: First National Bank Bldg., Pittsburgh 22, Pa. Executive secretary: A. C. Newton.

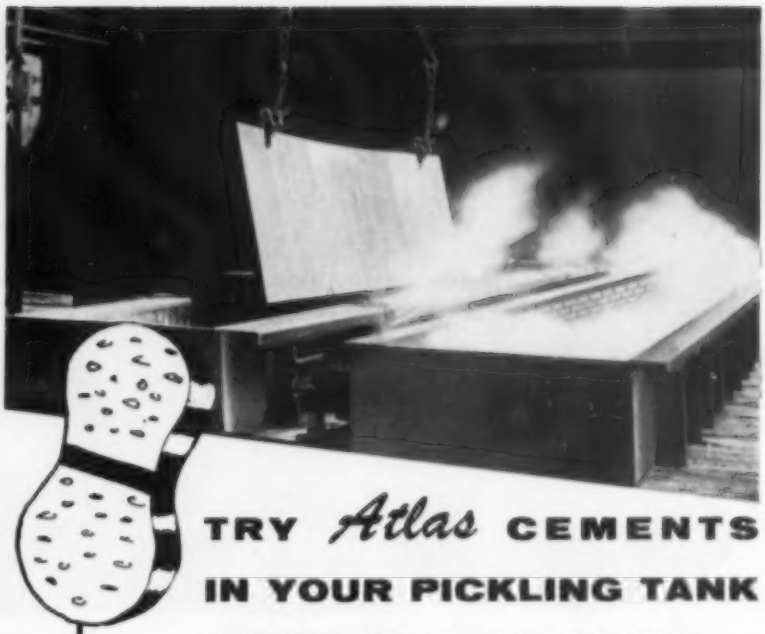
May 23-24, American Steel Warehouse Association: Annual meeting, Hotel Statler, Boston. Association's address: 442 Terminal Tower, Cleveland 13, O. Secretary: Walter S. Doxsey.

May 23-25, American Management Association: General management conference, Roosevelt hotel, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

May 23-25, American Society for Quality Control: Annual meeting and exhibit, Hotel Statler, New York. Society address: 50 Church St., New York 7, N. Y. Executive secretary: C. Eugene Fisher.

May 23-26, Machinery Dealers National Association: Annual convention, Netherland Plaza hotel, Cincinnati. Association's address: 1346 Connecticut Ave. N. W., Washington 6, D. C. Executive director: R. K. Vinson.

May 23-26, National District Heating Association: Annual meeting, Edgewater Beach hotel, Chicago. Association's address: 827 N. Euclid Ave., Pittsburgh 6, Pa. Secretary-treasurer: John F. Collins Jr.



TRY *Atlas* CEMENTS IN YOUR PICKLING TANK WITHOUT OBLIGATION...

Next week, 3,000 plants in the United States will receive a folder offering an opportunity to test ATLAS CORROSION-PROOF CEMENTS in their pickling tanks. This test will consist of a sample briquette (shown above) joined with the proper Atlas cement. This briquette may be suspended in the pickling solution for any amount of time, and then examined for signs of wear or corrosion.

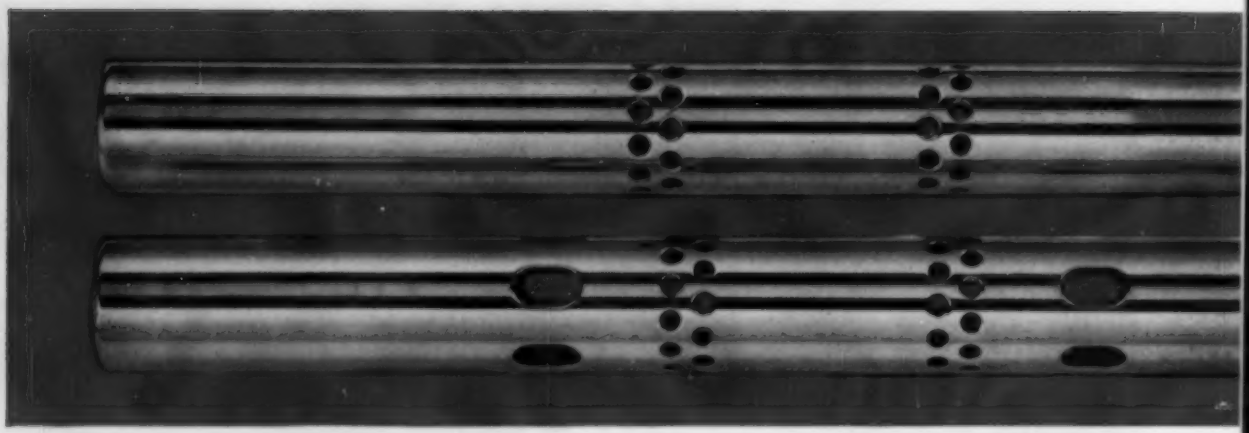
We, at Atlas, feel secure in suggesting this test, because we know that intensive research, controlled manufacture and experienced engineering make Atlas Corrosion-Proof Cements the best available.

SEE FOR YOURSELF!

If you want to try the proper Atlas cement in your pickling tank, drop us a post card, tell us the type pickling solution you use, and we will send you a sample briquette without obligation.

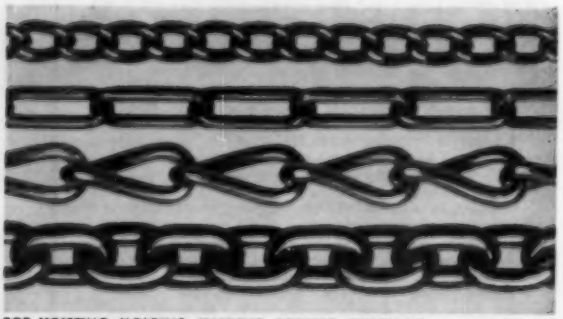
Sample briquette shown above measures approximately 1" x 3½" with 1" square center joined with Atlas Corrosion-Proof Cement.

ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA



Free-machining ENDURO®

MACHINING COSTS WERE REDUCED on these automobile door hinges when they were made from Republic Hot Rolled Carbon Special Sections. The component parts were cold formed by broaching. Tapping and drilling were the only other machining operations necessary. You can apply this economical method of mass producing steel parts where the section conforms to the predominating cross section of the part. Republic supplies hot rolled special sections in carbon, alloy and stainless steels.



FOR HOISTING, HOLDING, HAULING, TOWING, BUNDLING, you can count on Republic Chain for greatest safety and dependability. Republic's Round Chain Division makes a complete line of welded and weldless chain for every industrial requirement—every type of fitting, attachment and accessory. Strategic location of Republic Chain plants and warehouses assures you of prompt delivery

REPUBLIC STEEL CORPORATION
3120 East 45th Street,
Cleveland 27, Ohio

REPUBLIC STEEL

Please send more information on:

- ☐ Free-Machining ENDURO
- ☐ Hot Rolled Bars
- ☐ Chain
- ☐ Lockers

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Company_____

Address_____

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R-6182

THE WORLD'S LEADER IN LOCKERS. Republic's Berger Division offers a wide selection of standard steel lockers for every industrial use. Modern design assures full-time protection for personal property. Handles are tamper-proof, cannot be removed. Continuous door strikes along sides prevent insertion of tools for prying. Berger offers a complete locker planning, engineering and installation service.

helps control costs on highly machined stainless parts

These stainless steel plungers for pneumatic and hydraulic control valves require 30 separate machining operations in producing them. Costs could be expensive. But the manufacturer controls them by using Free-Machining ENDURO Stainless Steel Bars.

Republic's Union Drawn Division produces cold drawn bars with a fine surface finish, close tolerance, accuracy of section, uniform soundness for fast, economical production on highly machined parts like these. Free-Machining ENDURO provides the added strength and corrosion-resistance of stainless steel. Two grades, A.I.S.I. 416 and 430-F, are fully 90% as machinable as Bessemer Screw Stock.

Thus, you can apply the high physical properties and corrosion resistance of stainless steel to your duplicate steel parts—and still maintain economical, automatic production—by switching to Free-Machining ENDURO.

Republic ENDURO Stainless Steel is available in all forms, including hot rolled bars, special sections and wire. Republic metallurgists and engineers will give you expert assistance on applications, processing and use. Specify ENDURO on your next order for stainless steel bars. Mail the coupon for more information.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

You get longer life from charging boxes and peels cast in nickel UNIVAN steel

This special alloy steel has definite advantages over carbon steel. Due to its nickel content, for instance, UNIVAN has greater resistance to firecracking. And its high tensile strength provides greater resistance to torsional twist and shock.

So, if you're having trouble with excessive firecracking, distortion or breaking of your present castings, UNIVAN castings may be the answer to your problem—whether they be charging boxes, peels, bearing covers, couplings and spindles, tongs and tong levers.

We'll be glad to give you more information about the performance of UNIVAN castings on the toughest jobs. Or, if you want prompt service, just send us your blueprints for a quotation.

BLAW-KNOX

BLAW-KNOX COMPANY

Union Steel Castings Division . Pittsburgh 1, Pennsylvania

UNION PRODUCTS: charging boxes • peels • bearing covers • slag pots • tongs and tong levers • universal couplings and spindles • gears and pinions • ingot cars • charging box cars • special UNIVAN and ARMOR steel castings

"Fuel for the Furnaces" by Agnes Potter Lowrie, famed artist daughter of a noted steelmaker. In this first of a specially commissioned fine arts series, Mrs. Lowrie finds beauty in weathered iron ore, creamy limestone, shaggy coke — basic elements so common most steelmen take them for granted.

The Fine Art of Steel Making

For 60 years the history of American industry has been the story of steel. You know the landmarks. The old, slow hand mill. Table trains with their lusty offspring, the continuous strip mill. And more recently, the speedy, almost automatic four-high mill.

During these 60 years every forward step in steel production has been paralleled by an equal advance in Ironsides Gear Shield lubricants. Heavy duty Gear Shield, once hand-paddled onto exposed gears, is now formulated with a solvent for quick spray application.

With increased use of encased gears, Gear Shield was produced in liquid form for pouring, pumping or timed-jet application. As pressure on production increased, Ironsides was among the leaders in developing extreme pressure lubricants.

Today, so widespread is the acceptance of Ironsides lubricants that other makers often refer to their own products as "gear shields", even though Gear Shield is an Ironsides trade mark.

Ironsides is not mass production. We are the "custom tailors" of lubrication. Our special position is due in large part to our flexibility. We can—and do—formulate for individual applications and supply these formulas in any quantity from pails to tank cars.

We like tough problems, and we've solved a lot of them. For example, Palmoshield, replacement for palm oil and most important advance in lubrication since World War II.

If you have a special problem, we'd like to help you lick it. A letter or phone call will summon one of our research engineers. Address The Ironsides Company, Columbus 16, Ohio.

SHIELD PRODUCTS

Ironsides

By the makers of Palmoshield • "the palm tree that grows in Ohio"

Bundy solves refrigeration problem with unique tubing strainer design

Read how Bundy Engineers work with designers to help make better products

As a designer, you undoubtedly know that Bundy is the leading manufacturer of small-diameter steel tubing. You've probably seen it specified many times.

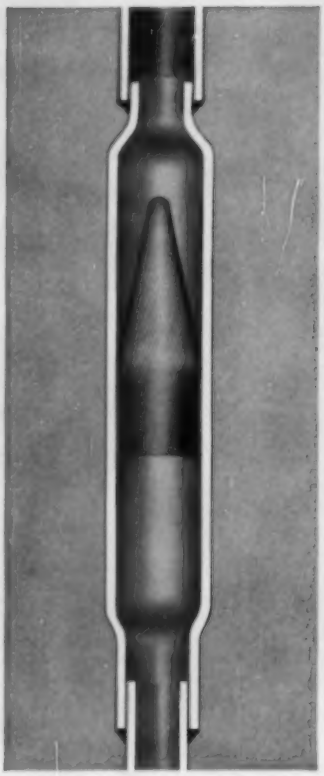
But, for *you*, there is more than manufacturing going on at the Bundy Tubing Company.

Shown at the right is a typical example of the help you can get at the design stage of your product. It is just one of hundreds of contributions which have been made by our engineering staff, in many widely diversified fields.

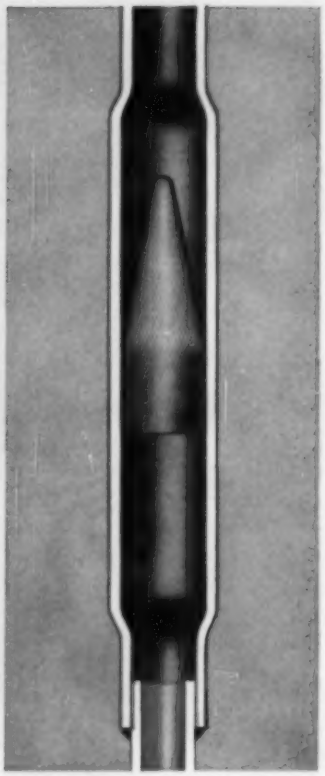
Take advantage of this unbeatable Bundy combination: expert, free engineering service plus genuine Bundyweld Tubing, the only tubing double-walled yet stronger; has high thermal conductivity, high bursting strength; takes easily to any fabricating operation. It is the safety standard of the refrigeration industry, *and is used in 95% of today's cars, in an average of 20 applications each.*

Let Bundy help you with that tubing design problem. Call, write, or wire us today:

BUNDY TUBING COMPANY
DETROIT 14, MICHIGAN



Problem: Because refrigeration systems can be quickly ruined by dirt particles which lodge in capillary tubes, most systems use a separate strainer assembly, as shown above. The two extra solder joints used to install the strainer assembly give rise to an even greater problem—leakage. Expensive hand assembly methods also frequently introduce dirt into the system.



Solution: New Bundy design actually makes strainer an integral part of condenser coil. The coil end is expanded to receive the strainer or filter and then swaged down to capillary size. This ingenious design eliminated one solder joint with its consequent risk of leakage or dirt inclusions; resulted in a cost savings of 50% to the customer.

Bundyweld starts as a single strip of copper-coated steel. Then it's

. . . continuously rolled twice around laterally into a tube of uniform thickness, and passed

through a furnace. Copper coating fuses with steel. Result . . .

Bundyweld, double-walled and brazed through 360° of wall contact.

NOTE the exclusive Bundy-developed beveled edges, which afford a smoother joint, absence of bead, and less chance for any leakage.

BUNDYWELD TUBING®

DOUBLE-WALLED FROM A SINGLE STRIP

LIKE FINDING GOLD!

That's the way it's been—for foundries that have changed to CUT STEEL during the past year. For this amazing, new type abrasive is *making money* for these foundries, by doing an incredibly better job of cleaning *and* drastically reducing cleaning costs. You see, CUT STEEL is actually *cut* from high quality, alloy steel—which gives it properties and advantages possessed by no other abrasive. If you haven't tested CUT STEEL in your cleaning room—you should! It's like finding gold!

Grade "A" CUT STEEL sells for less than most cast steel shot!
Grade "B" CUT STEEL costs no more than most malleable shot!

Sooner or later, you too, will change to CUT STEEL!

CUT STEEL
ABRASIVE

ANNEALSHOT and SUPER-ANNEALSHOT

PRODUCTS OF

METAL BLAST, INC.

872 EAST 67th STREET • CLEVELAND 3, OHIO

In its original form, CUT STEEL resembles steel grit with sharp edges and corners.

In usage it rapidly changes to a spherical shape in a wide variety of sizes.

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metalworking management...

Build the strength of STEEL

into your advertising program

Gone are the days of one-man management. Along with growth and the ever-increasing complexity of doing business, more and more key men have moved into the metalworking management area at *every* level. Today, decisions that affect you are in the hands of *The Management Group.*

To meet the needs of its readers, STEEL has been gearing its editorial reporting to the *management interests* of administrative, production, engineering and purchasing men.

Have *you* seen a copy of STEEL lately? Take a new look at its editorial approach and you'll see why your advertising in STEEL is selling *all levels* of metalworking management . . . making your advertising dollars worth more by reaching *The Management Group!*

TRIAL ENGINEERING

Edited for metalworking men at every management level . . .

A Penton Publication

(Advertisement)

Fallacies and Facts for Cemented Carbide Users

A few blunt—but needed—clarifications by the manufacturers of Carboloy Cemented Carbides

When you buy carbides, you're really buying *production ability*. You're buying *what carbides will do in your shop in terms of metal removal.*

If you're a tool engineer or designer, production foreman or machinist, you translate this into feeds, speeds, and depths of cut.

If you're in operating management, you also look for production ability, but you pinpoint it under the heading of greater machine efficiency, decreased downtime and lower tool inventories.

If you are a purchasing agent, your primary concern is getting the most for your money – but "most" in terms of production ability.

And, if you're in the top management group, your terms for production ability are: greater return on capital investment; decreased unit costs and increased gross margins.

The fallacy of overemphasizing the "Quickie Deal"

Be wary of the "quickie deal" involving price or discounts. You don't purchase with *production ability* in mind when you fall for these. Reason: while carbides look alike, *they don't perform alike.* And because of this fact, they can't be used interchangeably to bring the same on-the-job results. Their production ability varies – in some instances, tremendously.

The fallacy of the so-called "Industry Standard" Chart

Be wary, also, of the carbide salesman who shows a so-called "industry standard" carbide grade selection chart and says that each producer's grade within a category will perform equally well. They won't, because these are merely recommendation charts, *not* "equivalent" or "comparison" charts. Like most other products, carbides are made by different manufacturing processes and techniques, with varying degrees of engineering know-how and quality control exerted during processing. (Carboloy has one carbide engineer in its home office for every two salesmen in the field!)

The fallacy of using "Carboloy" to mean *any* brand of cemented carbide

And be wary of the salesman who tells you that his company makes "Carboloy." Unless he's one of our 70 field sales engineers or a representative of our 130 Authorized Distributors, his claim is in error. The name "Carboloy" is *our* registered trademark. It cannot be used synonymously with "cemented carbides" because it refers to one brand, and to one brand alone – *Carboloy* cemented carbides.

However, we do frequently receive complaints from people who say they have been sold "Carboloy," when they actually got another brand of cemented carbide that could not equal true Carboloy cemented carbide in *production ability.* Having our name used so freely by others is, we suspect, a problem that might come under the heading of "The Penalty of Leadership."

The facts about the need for advanced carbide engineering

Another facet of the responsibility that goes with leadership in the carbide industry, is the continuing engineering program carried on by our organization to prevent what might be termed a stagnant technology in the carbide field.

You, the user, impose ever-increasing demands on cemented carbides. And this advanced Carboloy development program is a major factor in keeping this vital phase of metallurgy ahead of the requirements you impose.

This emphasis on technical progress – resulting most recently in the new Carboloy Series 300 carbides – is another of the plus factors built into our product that the user can't always see.

The facts you can determine for yourself

We offer this suggestion – when you buy or use carbides, find out for yourself which carbide will give you the most production. If you care to, ask a Carboloy sales engineer to help you run the tests – but *you* set them up, in *your own* shop. Then compute your carbide cost based on *production ability.*

We have hundreds of in-plant case histories proving what our grades will do under any operating conditions. They show you how you get more for your carbide dollars when you specify *Carboloy* cemented carbides from your distributor or toolmaker. Write, or call, for assistance in getting the most out of your tooling dollars.

"Carboloy" is the trademark for products of the Carboloy Department of General Electric Company

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

11141 E. 8 Mile Blvd., Detroit 32, Michigan

Carboloy Created-Metals for Industrial Progress

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Performance...
Durability...

Victor presents . . . **8 completely new cutting torches**

Models ST-1000, ST-1100, ST-1200 and ST-1300 Hand Cutting Torches . . . Model CA-1050 Hand Cutting Attachment . . . and Models MT-200 and MT-300 Machine Cutting Torches.

These completely new designs feature modern-clean-streamlined-sturdy lines . . . stainless steel preheat gas mixing chambers . . . heads of forged Everdur bronze or Monel . . . valve bodies and "Y's" solid die forged brass . . . hand-fitting oval shaped fluted brass handles . . . choice of cutting oxygen lever in four locations, top and bottom, front and back.

VICTOR Quality Cutting Torches will do a better job and stay on it under all kinds of difficult cutting operations.

VICTOR welding

VICTOR EQUIPMENT COMPANY

Mfrs. of welding & cutting equipment; hardfacing rods, blasting nozzles; cobalt & tungsten castings.

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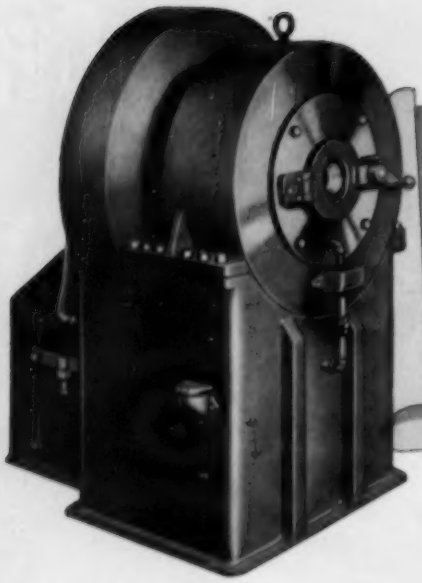
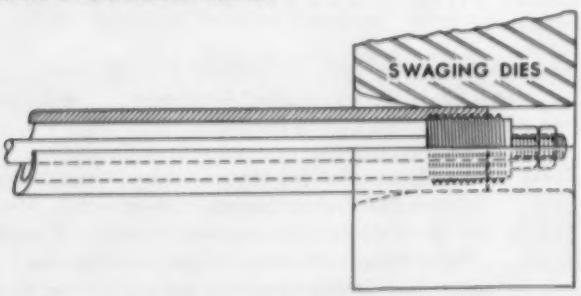


Swaging Success Stories

Forming Internal Threads ...by Swaging

The internal threads on this tube were formed quickly and economically by swaging over a mandrel.

First the end of the tube was expanded to receive a mandrel of the same diameter as the desired thread.



With the mandrel in place, the expanded section was then swaged to its original OD and the mandrel unscrewed. Result: Accurate internal threads with quality and finish of expensive machined threads. Uniformity from piece to piece was excellent.

Mandrel swaging can be used to form internal threads with practically all metals. It is particularly advantageous when working with aluminum and other metals that are difficult to machine.

Swaging can be your key to time and cost savings!

1. It's fast—often the fastest way to get a forming or finishing job done.

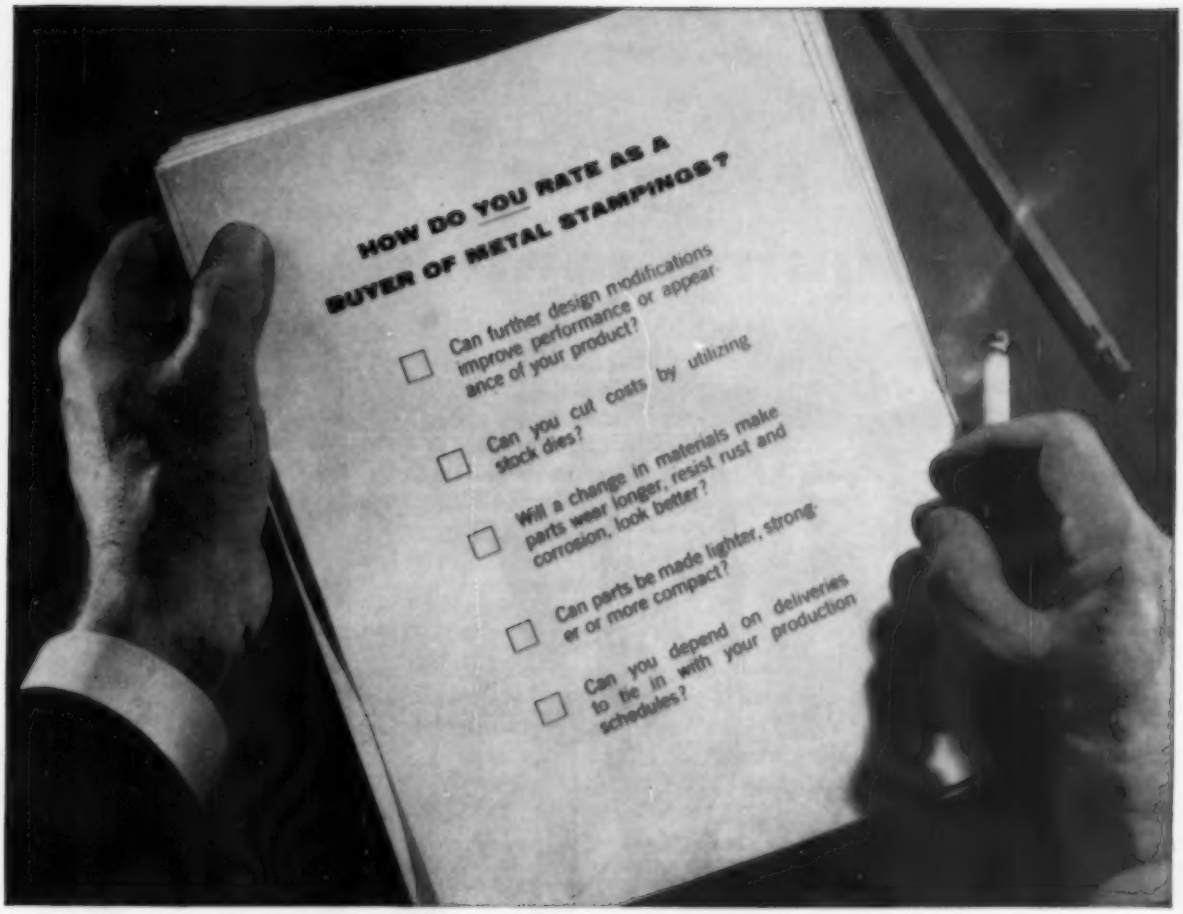
2. It's easy—can be done with unskilled labor.

3. It's economical—eliminates expensive machining operations without sacrificing quality.

Write for our informative booklet on swaging. It contains detailed descriptions of the Torrington Rotary Swagers. It also may carry the key to a "swaging success story" in your own plant.

THE TORRINGTON COMPANY
Swager Department
150 North Street, Torrington, Conn.
Makers of Torrington Needle Bearings

TORRINGTON ROTARY SWAGING MACHINES


HOW DO YOU RATE AS A
BUYER OF METAL STAMPINGS?
Can further design modifications improve performance or appearance of your product?
Can you cut costs by utilizing stock dies?
Will a change in materials make parts wear longer, resist rust and corrosion, look better?
Can parts be made lighter, stronger or more compact?
Can you depend on deliveries to tie in with your production schedules?

can your metal stamped parts be improved or produced at greater profit* to you?

To tell you "how" and "why" it may be possible, The Crosby Company has just published an informative report: "Removing the Questionmarks from Metal Parts Procurement". In it, you will find specific ways in which Crosby can assist you in checking every major design and cost factor relating to metal stamped parts.

Much more than a production stamping plant that merely "bids" on jobs, The Crosby Company makes a thorough study of every metal stamping inquiry. You receive an *Engineered Quote*. Often products are improved, money saved and profits increased as a direct result.

You can obtain the complete story without cost or obligation. Simply fill in and mail the coupon below.

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Titanium?
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Today American Welding supplies flash butt-welded rings to every U. S. jet engine manufacturer. Our modern plant is equipped to perform not only rough ring operations, such as forming, welding and sizing, but also whatever machining you may require.

In many cases where circular metal components have been made by some other method, flash butt-welding of bars, plate or special mill-rolled shapes has saved our customers thousands of dollars.

Our Industrial Products Division may be able to suggest similar economies for you. Why not write today — they will be glad to study your problem. (For a prompt analysis, include blueprints and specifications.)

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PRODUCTION FACILITIES CATALOG
Ask For Free Copy

Metalworking Outlook

Tax Cuts Coming?

The Committee for Economic Development urges planning now for federal tax reductions in fiscal 1957. Its Research & Policy Committee believes that first priority should be given to individual income tax reductions in all brackets. Next should come lower corporate rates and excise levies. It favors relatively greater reductions in upper personal bracket rates. The group believes that corporate income and excise rates should not be continued at present levels beyond Apr. 1, 1956, the date now scheduled for reduction. CED points out that with high employment and normal growth of the economy, present tax rates would yield substantially more revenue in fiscal 1957.

Defense Budget Aired

Legislative wheels started creaking last week to act upon the Defense department's budget request of $34.6 billion in new money and more than $46 billion in cash expenditures. Pentagon people will make much over the fact that they already have trimmed the request extensively, particularly for Air Force allotments. The Air Force originally wanted $6.8 billion for new contracts, but that was reduced to $6.1 billion.

No Hurry on Standby Controls

The White House appears in no hurry to get the Defense Production Act extended. It expires June 30. The administration is delaying action because of the touchy economic controls. Its reasoning: If a time can be picked when there is relative international calm, the request for standby authority to impose wage and price freeze orders wouldn't bring any major climb in prices.

Economists Shift on GAW

Economists who once were receptive to the United Auto Workers' type of guaranteed wage plan are withdrawing their support. The U.S. Chamber of Commerce quotes an opinion given by Harvard's Sumner H. Slichter that "the union's proposal is ill conceived." It also cites the comment by the Princeton professor, Richard A. Lester, who helped the UAW draw up its plan: "Academic experts seem in agreement that 'adequate' unemployment compensation under governmental auspices is preferable to any arrangement for private supplementation of state benefits. That is my position."

Monopoly Matters

Look for a Federal Trade Commission report on mergers within the next week or two. The study will outline chief causes of mergers and will point out that corrective legislation is needed to deal with some of the major problems . . . Attorney General Herbert Brownell caused alarm last week when he told the U.S. Chamber of Commerce that some industrial advisory

committees (IAC) "have participated in practices raising questions under the antitrust laws." IACs have as members businessmen who meet periodically to advise governmental agencies.

Fewer Companies

One effect of the 1954 recession: The business population dropped for the first time in a decade. At the beginning of this year, there were 4,182,000 firms, compared with 4,185,300 a year earlier. Since 1945, business population has increased each year, up to 1954, starting from 2,995,000 firms ten years ago.

Trouble in Transportation

Shaping up is a major hassle on transportation. That will delay congressional action on the President's transportation report. In this session of Congress, look for little if any action to implement the report with legislation. Lined up in general support of the report are the railroads. The major group opposing it: Truckers.

Coming: Atomic Merchant Ship

President Eisenhower's plans to send a new, atomic-powered merchant ship around the globe reveal that such a ship is in the works. It won't revolutionize our merchant marine immediately. Its propulsion unit probably will be built around a pressurized water reactor of the type that powers the *Nautilus*. Newport News Shipbuilding & Dry Dock Co. has a contract for an atomic Navy vessel and is running its own study of merchant ship applications. Bethlehem Steel Co.'s Quincy, Mass., yard is studying the application of nuclear power to commercial ships under a contract with the Atomic Energy Commission. Westinghouse Electric Corp., which built the *Nautilus* power plant, is to develop propulsion for a large Navy ship.

Straws in the Wind

Guided missiles and aircraft research and development will take one-third of the Defense department's requested $1.4-billion military research appropriation in fiscal 1956 . . . Industrial demand for molybdenum in this country and abroad continues better than expected, says Arthur H. Bunker, president of Climax Molybdenum Co. . . . The House has voted to extend the Renegotiation Act, and the measure is being considered by the Senate Finance Committee.

This Week in Metalworking

The labor pot is coming to a boil (p. 45) . . . Prospects for lead are improving (p. 46) . . . Truck-trailer makers expect a near-record dollar volume in 1955 (p. 47) . . . Roger M. Blough and Clifford F. Hood take over the helm of U.S. Steel Corp. upon Benjamin Fairless' retirement (p. 48) . . . Progress report on the St. Lawrence Seaway (p. 50) . . . Construction booms builders hardware (p. 56).

"I need 6000 lbs. of structurals this afternoon--how about it?"

(A true story) It was 4:10 in the afternoon when the purchasing agent of a construction company called his desk man at Ryerson. "I need some structural channels in a hurry—12 inch, 25 pound . . . let's see, 12 pieces—that's 6000 lbs. Can I have it today? I'm really in a jam."

Ryerson's large stocks of ASTM-Spec A-7 structurals included just what was wanted. The steel was immediately cut and loaded, and at 4:35—just 25 minutes after the call—our truck rolled into the construction company's yard. They were then able to fabricate the channels in their own shop and have them in place by 11 P. M.

"I thought of Ryerson because I've always had good service from you," the customer commented later. "I know I was asking a lot, but you really came through for me!"

Whether it's your day-to-day requirements, or help in an emergency—count on Ryerson. Here are the world's largest steel stocks—unsurpassed facilities—and an organization eager and able to deliver. When you need steel—of whatever kind . . . call Ryerson.

RYERSON STEEL

Principal products in stock: bars, structurals, plates, sheets, tubing, alloy and stainless steel, re-bars, etc., also machinery and tools.

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Can we be useful to you?

RELIANCE STEEL

DIV. DETROIT STEEL CORPORATION

Processing and Distributing Plants

CLEVELAND PLANT, CLEVELAND 27, O. . VUlcan 3-3600
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Reliance Customer Representative Offices

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RELIANCE *Job-Fitted* PRODUCTS

COLD ROLLED STRIP STEEL
Coils • Cut Lengths • All Tempers

SHEETS
Cold Rolled • Hot Rolled • H.R. Pickled
Galvanized • Long Terne
Standard or Production Sizes
Sheared or Slit to Actual Working Dimensions

(ANOTHER ACTUAL EXAMPLE)

THE JOBS

Engine bearing backs

THE STRIP

GAUGES: . . . . . .050" to .156"
THICKNESS TOLERANCES: . . . . . ± .001"
(for all specified sizes)
WIDTHS: . . . . . 4" to 9"
QUANTITY
SHIPPED (during 1954) . . . . 1,225,589 lbs.
RETURNS AND
ALLOWANCES (on above) . . . . . 1,685 lbs.

ON-THE-JOB PERFORMANCE . . . 99.86%

Such near-perfect performance is unusual. Yet, of all our customers who took in more than 500 tons of DSC Strip during 1954, 62% of them experienced on-the-job performance of better than 99%—some even 100%—in a year when *total inspection* was the rule!

The example given is unusual in itself. Maximum permissible thickness variation on all specified sizes was ***±.001" or .002" overall.*** This is "more restricted than standard" by as much as 66⅔%. Compare this with the standard tolerances shown in the following tabulation:

ORDERED THICKNESS		STANDARD OVERALL TOLERANCES	
From	To (incl.)	4" to 6" (incl.)	Over 6" to 9" (incl.)
.050"	.068"	.005"	.005"
.069"	.099"	.005"	.006"
.100"	.160"	.006"	.006"

WHAT DOES IT PROVE?—That in the long run—when the tools, the job and the steel are properly mated, DSC Strip consistently meets or beats recognized standards for strip performance.

How about talking over your requirements?
Just call your nearest DSC Customer Representative.

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DSC MILL PRODUCTS
Hot Rolled and Cold Rolled Sheets
Cold Rolled Carbon Steel Strip — Flat Cold Rolled Carbon Spring Steel
Low and Medium Carbon Manufacturers' Wire — High Carbon Specialty Wire
Aluminum Cable Strand Reinforcement — Rope Wire — Tire Bead Wire
Welded Wire Fabric

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IN FURTHERANCE OF THE METAL STAMPING INDUSTRY

Planning a Fall trip this year?
Why not combine business and pleasure by attending
THE PMI ANNUAL MEETING—GROVE PARK INN, ASHEVILLE, N. C.
for complete details write to
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OCTOBER 9-12 1955

Let's Explain Automation

Automation . . . no other word is so generally misunderstood.

To many a man in the street, automation has assumed the ominous proportions of a robot-like factory designed to devour raw materials at one end and spew out countless millions of finished products at the other—all without human guidance.

An article in the current issue of a popular magazine describes a transfer line for machining automobile engine blocks as carrying its own railroad within its bowels. Blocks ride from station to station "without a man to help."

To labor, automation is a device to rob men of jobs. Labor says the guaranteed employment plan "will insure that automation is not introduced in irresponsible ways which produce hardship and suffering for many thousands of workers."

To many in industry, automation still is associated with such awe-inspiring terms as cybernetics, servomechanisms and feedback principles. It is glowingly described as marking the dawn of a new era—the second industrial revolution.

There's nothing mysterious or frightening about automation. During World War II, our creative energies were focused on the development of improved weapons. We paid less attention to the machines that made them. Automation is largely the peacetime expression of the technological know-how accumulated in developing wartime weapons.

Automation is the means of:

—Eliminating the back-breaking drudgery of repetitive operations. The workman becomes the supervisor of a machine rather than its slave.

—Raising productivity through more intelligent use of machines and controls. This is necessary because the gross national product is increasing faster than the work force.

—Producing more goods at lower cost so every American can enjoy the benefits of a higher standard of living. A $3000 automobile would cost 25 times as much if produced by hand labor.

—Assuring an adequate and superior defense capacity. Wars are won on the production line, not the battlefield.

Industry is in the ridiculous position of defending an improvement in manufacturing methods that not only is logical but absolutely essential to the growth and well-being of our nation.

Your management, your employees and your stockholders want to know what automation means to them and to your organization. Why not tell them?

Irwin H. Such
EDITOR

But can you be sure it will work as well next month?

When your steel starts with ore from the same mines, reduced to iron in the same blast furnaces, refined to steel in the same open hearth furnaces, rolled on the same mills, by the same men, time after time, order after order . . . you can be certain that your steel is as uniform in quality as the best raw material sources, the finest steelmaking facilities and the most experienced steelworkers can make it.

INLAND STEEL COMPANY
38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul Davenport • St. Louis • Kansas City • Indianapolis Detroit • New York

Principal Products: Sheets • Strip • Structural Shapes • Plates • Bars • Tin Mill Products • Rails and Track Accessories • Coal Chemicals

Will many walk out in '55? That's the question as . . .

Labor Stirs Contract Storm

THE 1955 LABOR POT is coming to a boil.

Ford will bear the initial brunt of the UAW's demand for a guaranteed annual wage (GAW). Policymakers of the steel union will meet May 11 and 12, to decide on wage proposals. There also is the possibility of a rail strike.

Automakers — Ford Motor Co. must reach a contract decision before General Motors Corp. GM was taken "off the hook" as the first candidate when the CIO, United Auto Workers decided to terminate its labor contract with them on June 7—six days after the Ford contract expires. Walter Reuther, president, UAW-CIO, is on the scene at Ford, directing the strategy which he hopes will bring a GAW to his members.

American Motors Corp. also has been given a reprieve. Its contracts, which were to expire on June 1 and July 1, have been extended by the UAW to Aug. 12.

Rebuttal—Henry Ford II, president of Ford, states: "Perhaps what is needed is a new kind of prosperity insurance policy based on a reasonable, business-like, pay-as-you-go plan, with limited and predictable cost. As long as we are free to operate on sound business principles, we can afford to pay good wages and offer the kind of fringe benefits that Ford men and women now enjoy. Any proposed security plan that impairs the healthy conditions of the company with dead certainty will impair the real security of the worker."

GM is talking in terms of a new five-year plan. Reviewing some of the progress made in the last five, H. W. Anderson, vice president-personnel, states: "This plan has added up to higher pay, steadier employment and the addition of 128,000 new jobs." At this time, the union is willing to consider only a two-year contract.

Steelmakers—David J. McDonald, president of the steel union, is calling for a meeting of the wage policy committee and the executive board on May 11 and 12. Wage proposals will be drawn up at this time. Some 600,000 persons, employed by basic steel producers, will be affected. It is anticipated that wage demands will be considerably higher than the 5-cent hourly increase granted millworkers last year. Fringe benefits gave the workers a total increase of 10 to 12 cents then. The steelworkers already have served formal notice that wage contracts will be reopened this month.

Expectation is that the steel companies will grant a raise before the June 30 deadline, and that this will be the signal for a round of steel price hikes.

First GAW? — Philadelphia Local 105 of the International Union of Electrical Workers (IUE) claims that it has negotiated the first GAW in the current CIO drive. The union received a 9-cent hourly increase for all workers at International Resistance Co. Instead of taking it in wages, the local will apply the entire amount to a GAW fund. Details, to be worked out by management and the local, must be completed by Apr. 1 next year.

If there is no working plan by this time, workers will receive cash payment, plus interest. Local 105 members may prefer cash payment in a lump sum rather than a GAW plan—one factor which may bring strong pressure on local union leaders for disbandment of the GAW plan next April.

No GAW—Philco Corp. and IUE

have reached agreement on a new contract. The settlement, affecting 6500 workers in Philco's television and electronic plants, provides for a 5-cent hourly general wage increase and improvements in fringe benefits. GAW was not a serious factor in any of the conferences with the union.

Rails, Too—If no solution can be found in the debate on the pay and equity case (the union is demanding a graduated rate of pay and other benefits), there may be a railroad strike.

"This has been in negotiation for about five years now," states J. A. Paddock, senior vice president, Order of Railway Conductors and Brakemen. "If we don't get a settlement, there will be a strike."

Still Another — The UAW also will seek a guaranteed annual wage from Allis-Chalmers Mfg. Co. In addition, the union is asking for a uniform, six-plant master agreement, a 10½-cent pay raise and pension and health benefit increases for some 15,000 workers.

Strikes: March Tabulation

The Department of Labor reports that 220,000 workers were involved in 450 work stoppages in March, 1955—150 were holdovers from previous months.

Tally for the first quarter shows: Strike idleness is below any similar postwar period.

Wages Up, Hours Down

Straight time average hourly earnings of production workers in machinery manufacturing establishments rose 3 per cent from January, 1954, to January, 1955. During the period, the Bureau of Labor Statistics reports, scheduled weekly hours were reduced slightly.

Batteries, Tetraethyl To Pace Heavier Lead Use in 1955

LEAD CONSUMPTION in 1955 possibly will be up as much as 14 per cent over 1954. So says Simon D. Strauss, vice president, American Smelting & Refining Co., New York.

Speaking before the annual meetings of the Lead Industries Association and the American Zinc Institute, Mr. Strauss said: "As of today, production and consumption of both lead and zinc appear to be in approximate balance. If stockpiling were to stop, producers should not be faced with the problem of rapidly mounting stocks —as in 1952 and 1953."

Good Supply—That lead is readily available is evident from a report prepared by O. M. Bishop, commodity-industry analyst, Bureau of Mines. Estimated lead content of the world's measured and indicated ore reserves as of last December was 39,865,000 tons. With continued explorations uncovering new reserves every year, the 12 users of lead which follow can look forward to a plentiful supply of the metal.

Cable Sheathing: Rubber and other jacket materials have made inroads here. But heavy growth of power transmission should provide continuing market for lead. Outlook: 1955 should be better than 1954. Next few years should be on the 1952-53 level of consumption.

Ceramics: Electronics and the jet age will boost use of ceramics to four or five times beyond normal growth. Outlook: Use of lead could go into six-digit figures in the future.

Chemical Construction: Industry's familiarity with lead, plus its competitive cost, availability and chemical corrosion resistance are in its favor. Its weight and poor resistance to temperature and abrasion are against it. In the synthetic organic chemicals, lead doesn't figure to play an important part. Outlook: Because of the latter point, use of lead will not keep pace with the growth of the chemical processing industry.

Lead Paints: Standard warning about lead poisoning has been adopted for lead-paint cans, but much has to be done along these lines. Development of inorganic pigments continues. Outlook: Trend away from lead paints also continues.

Leaded Steel: On the basis of present steel industry capacity, ultimate output could be 400,000 tons a year, consuming 1600 to 1800 tons of lead. Outlook: Ultimate will not be reached for some time, but use is growing.

Metal Protective Paints: Nothing has been developed that will completely replace red lead paint. Much development on red lead must be undertaken if it is to hold that leadership. Outlook: Good growth in line with construction boom.

Nuclear Shielding: Where weight and space requirements outweigh added cost of cement, lead will be used for nuclear shielding. Mobile reactors will use lead shielding. Outlook: No great tonnages required until nuclear power is further developed.

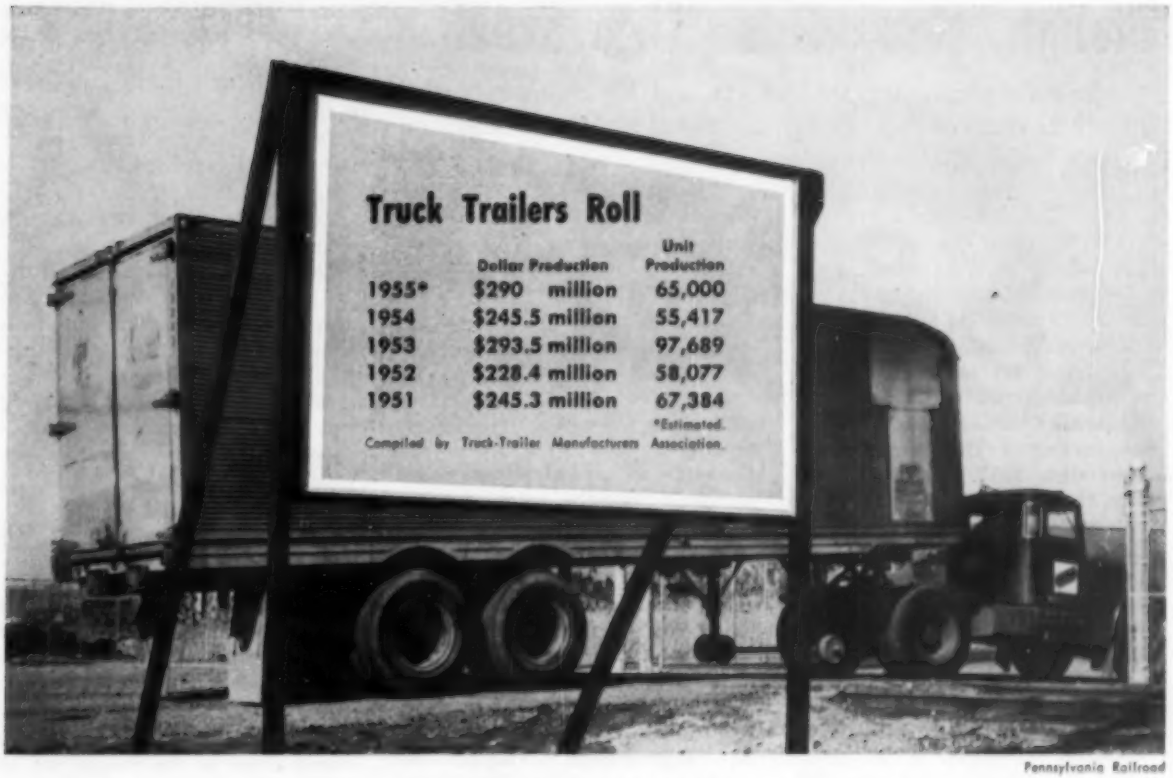
Porcelain Enameled Aluminum: Development of a 30-to-50-per-cent frit has increased color possibilities and working characteristics of this product. Outlook: The construction boom will result in good demand for lead for many years.

Railroad Industry: Dieselization resulted in increased use of battery plates but a loss in lead bearings. Lightweight passenger equipment and heavier freight stock have balanced out in lead use. Outlook: Until atomic-powered locomotives come on the scene, lead use probably will not increase.

Solder: Growing electronics industry will pace use of solder. Canning industry is still growing and using a higher lead content solder. Heavy auto production means more radiators. Outlook: 1955 will be better than 1954.

Storage Batteries: Replacement units in 1955 will be up 2.5 per cent over 1954; original equipment units will be up 5.5 per cent. Total batteries will number 31,760,000 units, up 4.5 per cent. Lead content will be about 400,000 tons, compared with 335,000 tons in 1954. Outlook: Excellent.

Tetraethyl Lead: New plants in England and Canada will take some business from U. S., but increased use of autos and gasoline continue to make this the No. 1 user of lead. Outlook: 1955 will be 4-5 per cent better than 1954. That rate of growth will hold for the next three to five years.



Pennsylvania Railroad

New Materials, Big Units Show Industry's Route

AUGUST FRUEHAUF started something when he built the first bona fide truck trailer in 1915.

From that beginning an industry grew which put the more than 550,000 civilian trailers on the road today. This year it will turn out 65,000 units (see chart).

Second Look—Production is bigger than it appears because military output will be the lowest in four years. Service vehicles are usually smaller than civilian types. Governmental agencies took 10,179 units last year, 44,516 in 1953 and 12,833 in 1952.

The estimated 125 companies in the industry will do $290 million in business this year, just a shade under the record $293.5 million transacted in 1953. Some 25 firms will handle the bulk of those sales. Fruehauf Trailer Co., Detroit, and Pullman Inc.'s Trailmobile Co., Cincinnati, are the largest.

Pass Along — Because truck-trailer manufacture is largely an assembly operation, suppliers play a big role in the business. Nearly 70 are associate members of the Truck-Trailers Manufacturers Association. They supply springs, axles, tires, wheels, rims, braking equipment, wiring harness, steel, copper, aluminum, other products.

This year the industry expects to use 1,625,000 tons of carbon steel, 65,000 tons of alloy steel, 9.1 million lb of stainless and 35.3 million lb of aluminum.

Growth Metal—Growing fastest is use of aluminum. That's because of trailer manufacturers' concern with weight reduction. Since before World War II, the trailer's weight-carrying capacity has doubled and its volume-carrying capacity has gone up one-third, but its weight is about the same because lighter metals are used—both aluminum and alloy steels. At least one firm, Strick Co., Philadelphia, builds a plastic van. Other firms use plastic sections—corners or roof caps.

Every pound saved in tare weight is worth $1 a year in additional freight that can be carried. Every cubic foot added means $50 a year to the carrier in more revenues. To get more weight and volume capacities, the industry has turned to tandem-axle, 35-ft vehicles. Before the war, the unit commonly was only 26 or 28 ft long with a single axle.

Trend—Another development in the industry is increasing standardization. That's to permit more trailer interchange.

Also promising is Fruehauf's new stainless steel tank car to transport oil and possibly other products (see page 60). If successful, it will increase sharply stainless use by the industry.

Value Up — All those developments mean that the average value per trailer is rising. It was $4496 in 1954, compared with $3790 in 1951.

Developments presage dramatic growth, too. When the industry celebrates its 60th anniversary in 1975, look for some 175,000 trailers to be built that year. Their value: $920 million.

Blough, Hood Guide U.S. Steel

As the new chairman, Mr. Blough will be chief executive officer to succeed the retiring Ben Fairless. President Hood is designated chief administrative officer

U. S. STEEL has turned over its corporate reins to younger "hands."

Roger M. Blough succeeds Benjamin F. Fairless as chairman and chief executive officer. Clifford F. Hood, president since 1953, takes on additional duties as chief administrative officer. Mr. Blough has been vice chairman of the board since 1952, general counsel since 1953.

Mr. Fairless, who reached the normal retirement age of 65 on May 3, will continue as a member of the board and the finance committee. He also will head a new executive advisory "team."

John S. Tennant, who became associate general counsel in January, is the new general counsel.

"Unless the chance for advancement is constantly kept alive, at every level of management, it would only be a matter of time until the most able of our younger executives would seek opportunities elsewhere," Mr. Fairless explained as he stepped down as chairman of U. S. Steel.

Perfect Timing—His move came at a high point in the corporation's history. First quarter results show steadily rising production and shipments. Total sales jumped over 5 per cent. Net income was up some 62 per cent. Total earnings were almost $73 million. Total operating expenses dropped some 2½-per cent.

The second quarter looks just as bright. Since early in the year, orders have exceeded production. Backlogs of unfilled orders have increased rapidly—total now is 6½-million tons.

In Retrospect—Taking a backward glance, Benjamin Fairless points out that in the last 20 years U. S. Steel has quadrupled sales, increased steelmaking capacity about 30 per cent and raised shipments 70 per cent. Since 1936, $3¼-billion has been spent on capital improvement. Capital expenditures for modernization amounted to $50 million in the first quarter.

Future—Authorized projects for improvements getting under way will require $433 million. Mr. Fairless reports that the equivalent of a Fairless Works will have to be created every two years for the next two decades in order for the company to retain its leadership in the industry. While this does not mean entirely new plants from scratch, it does mean that new capacity will have to be added to existing facilities, and that there will be a constant need for improved technology and better shop practices.

"We're Prepared"—The retiring chairman states: "Realistic appraisal of the long-range future can only lead to the conclusion that the prospects for our company are the brightest in its history. There never has been a time when it was better equipped and better prepared to meet the opportunities and responsibilities which lie before it."

Roger M. Blough (left) new chairman and chief executive officer, and Clifford F. Hood, president and newly designated chief administrative officer, will shoulder the responsibility for the success of U.S. Steel Corp. in the future

Steel Employment Up 13,500

Steel employment in March was 629,900, an increase of 13,500 over February. The gain was one of the largest in years, states the American Iron & Steel Institute.

The number of hours worked by employees in March—109,718,639—was close to the record set in 1953. Wage earners worked an average of 41.1 hours a week, compared with 40 in February.

The estimated March payroll was $288,229,000, against $255,130,000 in February.

Machine Tool Checkup Urged

More government machine tool buying may be on tap if one recommendation of the Hoover Commission's Task Force on Surplus Property is followed.

It advises a program for safe storage of important government-owned machine tools needed to produce aircraft, ammunition, atomic weapons and other strategic items. Part of the program would be a survey to determine if there are duplicates of critical tools in inventory. If no duplicates are in government reserves, the necessary tools would be bought and stored in a safe place near the plant where they would be used.

But there also could be a cut in spending. The task force recommends provisions for loan or lease of an idle tool from one government agency to another for an emergency need if it will prevent new buying and save money without jeopardizing national security.

Clevite's Weckler, Burwell and Myers set pace as . . .

New Products Mean Executive Diversification, Too

THINKING OF DEVELOPING new products? Clevite Corp., Cleveland, is discovering it means company expansion, plus the development of self-contained, diversified management units.

Clevite is composed of: Cleveland Graphite Bronze Co., Brush Electronics Co., Brush Laboratories Co., Clevite-Brush Development Co., Clevite Ltd., Harris Products Co. and Transistor Products Inc.

Sales Jump — This organization, which had sales of $60.1 million last year, was a one-plant company (Cleveland Graphite Bronze) in 1941—with sales of $10 million.

Bearings and bushings are still the basic commodity, accounting for about half the gross sales. There is a rapidly growing list of new products, which include: Rubber and metal parts, oil seals, wear plates, electronic instruments for industrial and research use, magnetic recording and reproducing equipment, transistors and diodes. A standard, long-established product line, bearings and bushings, is being complemented by electronic equipment to insure growth.

Status Quo—As each company joined Clevite, the firm's existing management was kept largely intact. The "central staff" has drawn its personnel from the individual companies forming the corporation and by bringing in some "outsiders." Examples: James L. Myers, chairman and president of Clevite, formerly was president of Cleveland Graphite Bronze. Herman L. Weckler, vice president and general manager, had retired from the same position with Chrysler Corp. He accepted his present assignment "because of the management challenges involved."

Central Staff Functions — This small advisory group is responsible to see that all the advantages inherent in common ownership are realized. Specific duties include: 1. Forward planning for the entire group. 2. Establishing over-all financial policy. 3. Providing performance goals. 4. Developing sound marketing data on which to base merchandising programs. 5. Co-ordinating the affairs of the entire "family of companies," so that each unit can add strength and contribute knowledge to other member firms.

Each company or branch is self-contained, its executives having full authority to bring out individual resourcefulness and independent action. While the central staff helps to integrate various elements, each unit has its own functional departments, such as accounting, personnel and sales.

Consolidated Research — At the top of the new research "package" is the research and development committee of the board of directors. This group sets the general research pattern. Under this body are two separate companies: Brush Laboratories, dealing with research into basic materials and their applications, and Clevite-Brush, developing new products and improving old ones. Both groups spend time on fundamental research.

Future—W. Russell Burwell, vice chairman of the board, reports: "We are paying particular attention to selecting new products and research programs. We do not want to become too diversified. It is our aim to maintain a good balance of products—also a good balance of abilities and personalities among the people who help lead the company and its units."

Brand Counterfeiters Beware

Conviction of the Barrack Electronic Corp. on a charge of brand counterfeiting is turning on the green light for General Electric Co. to inaugurate a campaign designed to "eliminate frauds."

J. M. Lang, tube department general manager, states: "We will increase our own investigative efforts and will co-operate to the fullest with the authorities in prosecution of cases involving brand counterfeiting of electronic tubes."

ODM Gives Tax Amortization

Certificates of necessity for rapid tax amortization were issued by the Office of Defense Mobilization for 52 new or expanded facilities from Apr. 7-20. Their value: Over $139 million.

The Seaway: Channel for Business

When it's completed in 1959, the auto industry alone expects to save $10 million annually on freight. The seaway could serve more than half of U.S. metalworking

SIX STATES with 40 per cent of the nation's metalworking plants will get an outlet to the sea in 1959. Two states, New York and Pennsylvania, with over 20 per cent of those plants, will get additional world ports when the St. Lawrence Seaway opens.

What will be the industrial significance of the seaway?

To find the answers, lake port cities—Buffalo and Oswego, N. Y.; Erie, Pa.; Cleveland, Lorain and Toledo, O; Detroit; and Duluth are spending $300,000.

The St. Lawrence Seaway Development Corp. gives these answers: Iron ore and grain will dominate first year traffic. By 1965, traffic will total over 52 million tons.

The seaway will allow the steel industry to grow and expand about where it is. Without the seaway, steel's increasing dependence on foreign ores might have impelled a greater move to seaboard areas.

In considering the effect of the project don't overlook the powerful fillip given to business by port development and construction of the seaway itself. Our share of the cost is limited to $105 million—Canada's is about $200 million. The construction of control dams and powerhouses by New York and Ontario will add another $600 million.

Getting Ready—Chicago has a $125-million port program under way. Facilities at Lake Calumet will transfer cargo from ocean ships to river barges, thus linking the Mississippi river barge system with the seaway. Milwaukee will start a $2-million viaduct. Windsor, Ont., proposes spending $19 million for port development. A $20-million cargo terminal is recommended in a port study at Toledo. Canadian ports are farthest along in port development, but each port is bidding for its share of more than 36 million tons of freight expected in the seaway's first year.

Up to 22 new ships and 7 new lines are expected in the St. Lawrence this year (the present channel is 14 feet). Experience gained with small ships (less than 2500 tons) will be valuable when the 27-ft seaway starts. The new channel will go only to Toledo. Upbound, a 21-ft channel at Detroit governs. Until it is deepened, small ships will continue going to the western lake ports.

Plans and Expectations — To start, foreign lines probably will use six 8000-ton general cargo vessels. France is building three new vessels of about 6000 tons. Luxury passenger traffic is not expected, but some ships will have from 13 to 15 cabins for passenger service. Overseas shipping is expected to exceed 5 million tons.

About three-fourths of the seaway traffic will be moved by lake-type ships. Top capacity will be 20,000 tons.

Detroit expects to get 300,000 tons of overseas freight in the seaway's first year. With adequate facilities, it hopes to raise this to 1 million tons.

Chicago expects to handle 50 per cent of the general cargo moving through the seaway.

Northeastern Ohio now accounts for about 3 per cent of the nation's industrial capacity. R. C. Heinton, marketing vice president, Cleveland Electric Illuminating Co., estimates the seaway will boost the figure to 5 per cent. He says: "I believe northeastern Ohio can become one of the major steel fabricating centers of the world."

Labrador Ore—M. A. Hanna Co. will take 6 or 7 million tons out of Labrador this year. Shallow-draft ships will bring 1 million tons down the St. Lawrence. In 1956, 10 million tons of ore will be mined —1 million tons will come down the St. Lawrence, 8 or 9 million tons will be shipped to Baltimore and Philadelphia. In 1959, the first year of seaway operation, another 10 million tons of ore will be mined —7 million tons will come down the seaway; the balance will go to Baltimore, Philadelphia, Canada and overseas.

The final level of ore shipments will depend upon business conditions and tolls. But additional railroad cars and equipment in Labrador would enable production to be doubled or tripled.

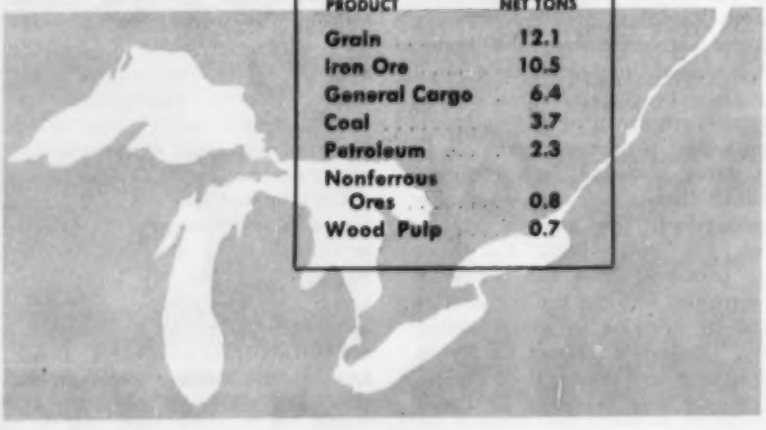
Other shipments of ore moving through the channel will come from Liberia, Sweden and South America.

Tolls, Gains and Losses—Tolls will be fixed by negotiations between the U. S. and Canada. The U. S. must pay off its portion of the seaway cost in 50 years.

Manufacturers selling abroad

Estimated First Year Seaway Traffic

PRODUCT	MILLIONS OF NET TONS
Grain	12.1
Iron Ore	10.5
General Cargo	6.4
Coal	3.7
Petroleum	2.3
Nonferrous Ores	0.8
Wood Pulp	0.7



will have a new advantage—cheap water transportation. Look for more machine tools, tires, farm equipment, hides, road-building machinery, cars, trucks and auto parts to be exported.

Bulk materials will come in on the seaway—manganese, petroleum, tin, rubber, chromite, sulphur, phosphate and bauxite. Chemical plants using bulk materials and needing plentiful water supplies will build along the Great Lakes. Savings of 10 to 20 per cent on shipping costs of bulk materials are predicted.

East coast ports may lose up to 20 per cent of their bulk material shipments. A total loss for all classes of cargo is estimated at 10 per cent. But our population will be 177 million in 1960. With this increase, east coast ports may find that the seaway, instead of cutting sharply into their business, merely will afford a breathing space to get ready for the increased production that an enlarged population will demand.

Celler Raps ODM

Independent aluminum fabricators are complaining to the Antitrust Subcommittee. Despite recent cuts in the stockpile take, they say they still aren't getting increased supplies of billets from some primary producers.

House Judiciary Committee Chairman Emanuel Celler (Dem., N.Y.) has written a letter of protest, blaming the Office of Defense Mobilization. Some mills, he writes, "refuse to accept orders for billets, which are relatively unprofitable, but will instead only accept orders for the more expensive semifabricated products, such as rods, bars and sheets."

Industrial TV Takes Color

Radio Corp. of America has added color to its closed-circuit television service for sales meetings, stockholder programs and other business uses. The new system projects color pictures on a 15 x 20 ft screen, and can be used to feed programs to local television stations or networks. Heart of the system is a 32-ft truck trailer which houses complete RCA Compatible-Color television equipment.

Needed: Better Managers

Needed skills can be taught, delegates told at National Metal Trades Association conference

THE LIMIT on your company's growth will be not customers, not products, not plants, not money, but managers. The development of better skilled managers at all levels —from first-line supervision up— is essential to meeting competition today and in the future.

That was the consensus of several hundred production executives who participated in the 10th annual plant-management conference of the National Metal Trades Association at French Lick, Ind., last week.

Immediate Value — Manager development, while the basic objective in long-range planning, also has immediate benefits. A good training program should show results within a few weeks or months.

Managing or working through others is a distinct and professional kind of work, says Harold F. Smiddy, vice president, General Electric Co., New York. It has a philosophy which is learnable, teachable and applicable. General Electric's approach is based on these principles: 1. Managing is a profession. 2. Adult development comes basically from within the individual. 3. No uniform plan is possible to fit the needs of everybody within an organization.

Four Steps — General Electric's program: 1. The establishment of a proper managerial climate. 2. The planning for self-development of each individual. 3. The planning for manager manpower to meet the needs of the enterprise. 4. The planning for manager education which will prepare men for the difficult task.

"The need for a positive approach to manager development is shared by every business. Slapdash, haphazard decision making is too perilous, and the need for teamwork is too great to continue to rely on the purely intuitive kind of managing which so often has been relied on—and, for that matter, often worked—in the past," warns Mr. Smiddy.

"No Foremen"—"We upgraded all our foremen to department managers," remarks Walter G. Koch, president, International Steel Co., Evansville, Ind. "The project initiated 16 months ago is having such beneficial results that it will be continued and expanded. It is bringing an entirely new concept of foremen who traditionally have been neither labor nor management."

Under International Steel's program, the foreman—now known as a department manager—is part of management's staff, participates in management conferences and biweekly information meetings. He undertakes work simplification and job analysis studies.

Self-development of first-line supervision is encouraged, and the company foots the bill on any approved program.

Suited—"Most noticeable change in the foreman to department manager policy has been in the physical appearance of the man," says Mr. Koch. "He wears business suits or slacks instead of factory clothes. Where once he listened to his workers' gripes and problems amidst the noise and rumble of production, he now has his own office on the factory floor.

"This makes for better organization and thinking, particularly because every single idea and suggestion is written down and later studied by an idea committee."

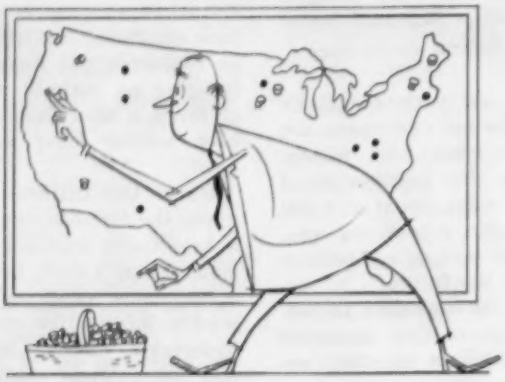
Costs Down—Results of International Steel's program: Lower costs, higher productivity and better profits.

"We are tremendously enthusiastic over our program to strengthen our first-line management," Mr. Koch explains.

Employees Use Taft-Hartley

Employees filed 67 per cent of the unfair labor practice charges against unions during the first quarter of 1955. Employers filed 28 per cent; unions, the remaining 5 per cent. The National Labor Relations Board reported 413 charges were filed against unions in the quarter.

In four out of five de-authorization elections, employees voted to revoke union shop clauses. In 23 out of 37 de-certification elections, employees voted to de-certify their union.



Can You Plug Hole in Defense Armor?

DEFENSE mobilization plans are about crystallized. Are you in on them?

Item — Who's getting the business? In placing orders, the services have been told to favor "planned producers" — the companies with defense output experience. During the Korean War, which wasn't a full mobilization period, 100 per cent of guided missiles, 92 per cent of electronics, 72 per cent of ammunition, 70 per cent of critical hard goods and 64 per cent of weapons contracts were procured through planned producers.

Item—The accent on tools is being carried through by all branches of the service. The Air Force is to spend $84.6 million of Defense department funds to buy 1000 machine tools, with a production lead time of 16 months or longer. Its total requirements for long lead time production equipment and machine tools are estimated at about $846 million. To build reserves, the Office of Defense Mobilization also is considering the extension of advance buying of tools and equipment, using some of its borrowing authority funds.

Item—Charles C. Finucane, under secretary for the Army, remarks: "One dollar devoted to increasing the production base can give us the same defense readiness as $4 in reserve stocks. One tank plant operating on a minimum basis gives us the same value as a stockpile of 11,500 tanks worth $1.5 billion."

New Power Goal

"We don't care where it comes from, just so it's electricity." That gives the official kiss of death to rumors that ODM's newly announced power goal expansion stems in part from the desire to boost the building of nuclear electricity facilities. The program is for defense mobilization.

Says George A. Landry, ODM's assistant director for production: "Our new goal of 150 million kilowatts by 1958 will provide alternative power for any area whose normal supply might be knocked out by a bomb attack." ODM is already making a start on processing certificates of necessity which have been pending since the suspension of the former goal in 1953. Industry estimates that to reach the goal, it will take more than $4.6 billion in power facilities, more than 1.3 million tons of steel products.

Titanium Tempest

The General Services Administration reports that E. I. du Pont de Nemours & Co. Inc. has asked and been granted another 90-day extension on its proposed 7200-ton sponge plant, after talking with ODM. It's a typical industrial reaction to the titanium tempest brewing in Washington.

But before the legislators swing into action, take an objective look at achievements. Ten years ago, most people thought titanium was something to clean teeth with. Though the program has blundered often, forced growth is at the heart of many of the difficulties. There's a rational case to be made for congratulations on the policies which have resulted in "too much sponge, not enough fabricating." Industry can't be expected to design a part without assurance that there'll be metal to make it next year.

Meet Joseph Eskridge: The new director of the Automotive Division, Business & Defense Services Administration, he's the first official of the automotive industry to serve in this capacity since the agency was organized in October, 1953. (Under a rotation system executives from industry serve the government without compensation for six months or longer.)

Mr. Eskridge entered the auto business in Detroit in 1919 as a draftsman with Dodge Brothers Corp. In 1926 he joined Hudson Motor Car Co. Today, he's vice president in charge of manufacturing for American Motors Corp.'s Hudson Special Products Division. He can be reached in Washington at Sterling 3-9200, Ext. 3295.

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It's the neck of a steel mill roll . . . and one of the toughest assignments in bearing protection. Scale is blasted off the red hot billets with cold water at 1800 psi. But specially designed C/R Oil Seals, with elements of Sirvene (synthetic rubber) never fail in their protection of the vital bearings. C/R won't fail you either, whether your sealing problem is big or little, simple or complex. Chicago Rawhide offers you unequalled oil seal development experience and facilities . . . and a large stock of available types and sizes. You can get acquainted with C/R by writing for your copy of "C/R Perfect Oil Seals."

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The new Toolmaster has everything

. . . and there's a good reason. Before a single drawing was put on paper, our market research engineers went into shops everywhere, asking what was wanted in a small manual feed toolroom milling machine. Operators, tool engineers, machine tool buyers, maintenance supervisors . . . all had a voice in the design of the new CINCINNATI Toolmaster. Yes, there's a very good reason why these new milling machines have everything desired for fast, low-cost milling operations in toolrooms, contract shops, tool and die shops, repair departments, and others. Just take a look at the three typical features illustrated below. They were operator-approved in actual field tests; management-approved in cost-of-production records. Would you like to have more information? Just write for new four-color catalog, No. M-1870-2.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

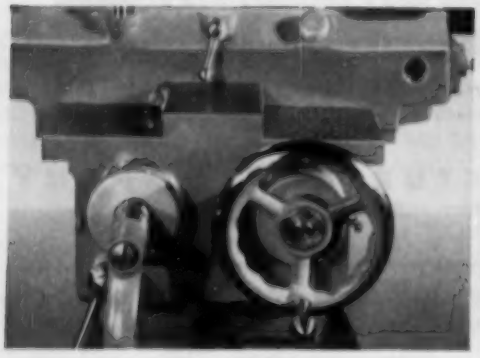
NEW CINCINNATI TOOLMASTER MILLING MACHINE	Built in three styles:	Range:
	1A—Manual feed to quill, 1 hp motor	16" table traverse
	1B—Power feed to quill, 1 hp motor	10" cross
	1C—Heavy duty head, 2 hp motor	17" vertical

CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES
OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

Extra Wide Knee

Has two advantages: wide square gibbed bearing ways for maximum strength; narrow guide for smooth cross adjustment.



Shaping Attachment

Jobs that would often be assigned to another machine can stay right on the Toolmaster with the ruggedly-constructed Shaping Attachment.

Oil-Shot Lubrication

Saddle-table parts and way bearing surfaces are lubricated from centralized oil-shot system.

Visser's Motto: For Competition, New Models

AS A MEMBER of Holland's soccer team, Gerrit A. Visser learned the lessons of competition in the Olympic Games.

After receiving his mechanical engineering degree in the late 1920s at the Technical Institute of the Netherlands, he decided to come to America—where competition was the steppingstone to opportunity.

Employment—Since then, Mr. Visser has worked at Holley Carburetor Co., Detroit, where he was in charge of methods tooling; Oldberg Mfg. Co., Detroit, as works manager; Jaeger Machine Co., Columbus, O., as engineer in charge of development and manufacturing; Manning, Maxwell & Moore Inc., Stratford, Conn., as chief manufacturing engineer.

He's now at Swan Engineering & Machine Co., Bettendorf, Iowa, where he's developing a new, 3-roller, spin-drawing machine.

His drive to find a way to do it cheaper and better has led to several developments (for which he holds patents) in the automotive, instrument and gage fields. "If America is to remain great," he says, "we must continue to create better production methods at lower cost."

Competition—"It is just wishful thinking that tariffs and trade agreements will protect us from world competition," Mr. Visser states. "Europe has a 5:1 labor cost advantage over us, but her philosophy has been: When you get something good, stick to it. Ours is a let's have a new model way of life, which stimulates creative thinking and will keep us in front industrially."

Caution—There is one factor he believes we must guard against: Young engineers, who will be tomorrow's managers, are specializing too much. Mr. Visser believes that companies should introduce more programs which will give engineers wider experience and training in co-ordinating development engineering, product design, process engineering and market analysis.

"You frequently hear warnings against our capacity to overproduce, especially in automobiles," he comments. "I don't believe we have anything to fear. We have tremendous growth possibilities."

"Our competitive way of life will promote our growth," he emphasizes. "And our standard of living will continue to rise. How many of us are looking forward to owning two cars?"

A growing population will also help to insure that the U. S. will not overproduce—that markets will continue to expand.

Caterpillar Tractor Co.

Builders Hardware: Construction's Growing Child

BUILDERS HARDWARE will lock up record sales of $320 million this year. Orders and shipments are 10 to 15 per cent ahead of last year's.

The hardware man's success hinges pretty much on the fortunes of his parent industry, construction, with the hardware bill averaging about 1 per cent of total material costs in residential building—nearer 2 per cent in commercial and institutional structures.

Front Door—Construction is expected to hit a record $40 billion this year. Add in the still growing "do-it-yourself" movement, and out comes a nice piece of change for some 180 hardware companies.

But those companies aren't content to sit on the back porch of the construction boom. Figuring out new ways to get in the front door is an important part of the business.

New Products — For example, Yale & Towne Mfg. Co., Stamford, Conn., has developed two types of concealed door closers to replace the usual, nonesthetic pneumatic or hydraulic kind in common use.

Kwikset Locks Inc., Anaheim, Calif., is active in powder metal products as well as being busily engaged in extending its line of locks. Schlage Lock Co., San Francisco, has a new line of door closers.

Fair Exchange—Not forgetting the hand that feeds it, American Hardware Corp., New Britain, Conn., is building a new plant at Clarksdale, Miss. It will house its door check department and some other operations.

Almost every metalworking operation is used in making builders hardware, from stamping to welding, forging, plating and diecasting. Steel and brass remain the favored raw materials, but stainless steels, aluminum alloys and metal powders are getting a bigger play.

Techniques—Not caught behind the door when cost-cutting tips are passed out, hardware firms are quick to take advantage of cheaper fabricating techniques. For example, diecasting considerably reduces the number of padlock parts with complex shapes.

Powder metals are coming in for more extensive use. On one lock cylinder, use of sintered brass saved 12 finishing operations needed for sand-cast cylinders formerly used.

Distribution—Only a small volume of builders hardware is sold direct from factory to user. Fully 95 per cent of it moves through wholesale distributors, general hardware stores and dealers in builders' supplies, such as lumber yards.

Even on large orders, such as would be needed for a school or office building, manufacturers usually work in close co-operation with district distributors.

Prices Steady—Considering the growing volume of business and the rise in general construction costs, hardware prices have held remarkably steady—they went up only 1 per cent in 1954, compared with 5 per cent for over-all building costs.

If prices of basic materials continue to climb, hardware probably will be forced to tag along. But one thing's sure: Business will be good.

Industry Finds Its Voice

Looking for more sales and better acceptance? One way is to have company speakers available who can sell your firm and industry in general to the community

SINCE 1950, Republic Steel Corp. personnel have given 1753 talks before 124,462 people.

Republic is just one of many metalworking companies that have found their voice through an organized speakers bureau. "American industry needs a strong voice," explains a Republic spokesman. Republic's talks help clear up misinformation about the steel producers. They also contribute to mutual understanding.

Selling Strategy—A growing number of firms are realizing that they can build better relations through keeping the community informed. For example: General Electric Co. has over ten speakers' bureaus in its divisions. A phone call to a GE district office will put you in touch with an experienced speaker. He will be able to talk on a wide variety of subjects, including atomic energy.

"Sometimes we're snowed under with requests for speakers," a company official admits, "but we encourage our people to address groups."

Bureaus Mushroom — Republic formed a speakers bureau in November, 1950. It proved to be so successful that six more have been organized in plant cities. In March, 1955, Republic speakers addressed 61 audiences.

Lack of experience shouldn't hamper a firm from reaching the public through talks. U. S. Steel Corp. has developed a speakers training program, while many other firms hire college professors to instruct a course in speechmaking. Others send management personnel to night school.

Another Way—Percy H. Whiting, managing director, Dale Carnegie sales course, reports: "Between 1949 and June, 1954, General Motors Corp. has held 350 Dale Carnegie courses, with a total enrollment of 14,300. Some 23 per cent of the corporation's salaried employees have completed this course in effective speechmaking."

If a high percentage of a firm's personnel are trained to speak in public, management can select the best man for any given assignment. This takes the load away from the "top executive" who often is the only qualified person to inform the public.

Remember—Often a metallurgist or plant representative, properly trained, makes a better speech in his specialty than a vice president who is already involved with a full schedule of speaking engagements.

Metalworking firms must sell more than hard goods today. Says one executive: "It's just as profitable to sell such intangibles as honest political practices, the need for engineers and fundamental data on the American economic system. One good way is through company speakers."

To Handle Speaking Requests Smoothly:

- **Publicize and promote what you have to offer in the way of speakers and subjects.**
- **Process all requests for a speaker quickly and efficiently.**
- **Do not make top management carry the ball alone. In a plant town, a plant representative may be a more logical speaker.**
- **Give professional speech training to a wide segment of management.**
- **Have an editorial committee check speeches before they are delivered.**
- **Do not give too many talks to one club or in one city or area.**
- **When possible, use preplanned visual aids to enliven speeches.**

Government Buys Metals

Progress in the government's purchase programs for strategic and critical materials as of Mar. 31 was:

Purchase of 3-million, short-ton units (20 lb each) of tungsten has been authorized—1,677,453, short-ton units had been delivered.

Manganese—purchases of 37-million, long-ton units (22.4 lb each) have been authorized, and 11,878,-867, long-ton units were delivered.

Purchase authorization of chrome ores and concentrates is 200,000 gross tons, of which 82,402 were delivered.

Mica deliveries were 5503 net tons—authorized, 25,000 tons.

Beryl deliveries were 626 net tons—authorized, 1500 tons.

Purchases of 1500 net tons of nonferrous crysotile asbestos (grades Crude No. 1 and 2) are authorized. Purchases totaled 847 tons.

Deliveries of columbium-tantalum ores and concentrates (foreign and domestic) totaled 9,084,159 lb.

Air Force Vs. Los Angeles

Air Force Secretary Harold Talbott's statement that aircraft contracting in Los Angeles should be stopped because of a "dangerous employment trend" is being sharply criticized.

Carl P. Miller, president, Los Angeles Chamber of Commerce, reports: "If Mr. Talbott wishes to cut off aircraft contracting in Los Angeles because 25 per cent of the city's industrial employment is in aircraft, I expect him to stop purchases of trucks and cars from Detroit where 46 per cent of the industrial employment is in the automotive industry.

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This Plymouth engine . . .

is really a plastic model as . . .

Plymouth Finds Dummy Makes Production Sense

PLASTIC V-8 engines are in preproduction at Plymouth's new engine plant.

The explanation for this moderately surprising statement is that they are full-sized plastic models of the 1956 Plymouth V-8 engine which, of course, will be built of metal. They are replacing metal, however, as prototypes for use in tryout of the equipment which will begin producing the Plymouth power plant come August in the division's new engine plant.

Cost Saver—The plastic engines are useful because blueprints give facts and figures but lack that old 3-D faculty for showing what's going to interfere with what. To solve this blind spot heretofore, preproduction engines have been handbuilt out of metal at highly premium prices. Such little tricks as hammer forming an oil pan and valve covers cost plenty. What's more, an engine built this way takes time to turn out.

Plymouth's problem was that it didn't jump on the V-8 tooling until early this year, and it's shooting for an Aug. 1 production date. That didn't allow a great deal of time for model building. Master Mechanic Ray McCarroll came up with the idea of plastic models.

Precedent — Though no other automaker has used plastic engine models before to the firm's knowledge, men at Plymouth don't see anything unusual in the application. Plastic replicas of sheet metal parts have been used by Plymouth for some time to try out welding fixtures and handling systems. Laid up in molds of plaster taken directly from the full-sized wooden models of the car, they permit quick and easy recognition of possible problem areas due to physical interference, which is difficult to foresee from just a blueprint.

That's pretty much the function served by the plastic engines. Complete engines were shipped to tool suppliers like Ex-Cell-O Corp., Cross Co., George L. Nankervis Co. and Buhr Machine Tool Co., while parts of the engines were shipped to others. That permitted the suppliers to check for clearance in the handling within the machine and answer other physical questions from the time they began to put the tools together.

In Practice—Plymouth has been using the engines, too. Among questions they have answered is the tryout of all mechanical handling for lack of interference. Railroad shipping racks were checked out with the plastic model engines. Motor test stands were developed with almost continuous use of a plastic replica of the real thing. Casting clearances were double checked, and, in one case, a slight change was made to avoid interference in assembly of the engine.

The engine lifting hook position was determined by lifting a plastic engine to find the balance point

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and type of hook required. The location of the stamped serial number and the type of stamping device required were determined through tryout of a plastic engine. The oil filler cap and breather pipe locations were changed after it was observed that interference might develop with the ignition wires when the engine was in service. And the assembly fixtures to handle the engines during build-up were developed by trying a plastic model and observing requirements such as tool access, etc.

Time Saver—"We refer to them just about every day for the answer to some question," reports Carl J. Demrick, Plymouth's vice president for manufacturing, "and I feel it's safe to say that they have saved us at least 90 days in the development of our fixtures and handling equipment."

That's a lot of significance for plastic engine models built from wooden patterns in about a week. While the wooden patterns were made specifically for the purpose, since foundry patterns are oversized to allow for metal shrinkage, officials still figure the cost for the eight plastic engines is less than for one hand-made metal unit by a considerable margin. Then, too, the plastic is much lighter and easy to handle while retaining dimensional stability and accuracy comparable to the actual castings.

Deadline—The chances of getting the Plymouth V-8 engine plant into operation by Aug. 1 looked pretty remote to some outside the division early this year. Already, plans are being made for the transfer of personnel, and supervisory people are starting to learn the equipment they will be handling in the new plant.

It looks quite probable that Plymouth will make its date on the metal V-8—in part thanks to the wisdom of a plastic dummy.

Fruehauf Rolls Along

Translucent plastic corners for illumination in the front of long tractor trailers was one interesting materials development reported by Fruehauf Trailer Co. recently. Also announced by the firm is a new stainless steel Volume Van and a new stainless steel tank trailer. The stainless steel van offers 35 per cent more capacity than the average trailer now on American highways, says the firm.

The firm also is experimenting with anodized aluminum for permanently colored trailer exteriors and expects to offer a variety of colors in the next two years if experiments are successful.

To meet demand for its products, which reached a new high in March (30 per cent above any previous month), Fruehauf has purchased a 100,000-square-foot plant at Delphos, O., and is building a sizable addition to its Ft. Wayne, Ind., plant. This brings to ten the number of plants in the U. S. and Canada.

Exhaust Notes

Chrysler Corp. announces seat belts as dealer-installed optional equipment on its 1955 cars. They will be sold in sets of three for the front seat alone or the car may be fully equipped with belts for six occupants. In view of recent findings by such impartial groups as the Cornell University, Indiana State Police and the University of California, there can be little doubt that the belts would materially help reduce the number of fatalities.

Everybody who learned in high school that a body in motion tends to remain in motion until it smashes against the windshield probably already has seat belts. Chrysler's move makes it possible for people behind the times to get caught up—for which some people some day will be grateful. It could be you.

Chrysler also announces it will make available as optional equipment transistor radios in 1956 Chrysler and Imperial models. Using only 10 per cent as much battery current as conventional auto sets, transistor radios also eliminate the vibrator, rectifier or transformer which account for 85 per cent of radio failures, say they. One problem: Limited transistor production should keep things in tight supply for a while.

American Motors Corp. announces a $60-million development program which will include a new engine plant and other production facilities in Kenosha, Wis. Already out is tooling for the V-8 expected to replace the engine being purchased from Studebaker-Packard Corp. Production facilities modernization, as well as the new engine plant, are slated for completion within 18 months.

Meanwhile, Ford announces a $625-million plant and equipment program to cover the next three years. Included, of course, is the new Lincoln assembly plant reported in this column last week. Mercury, completing its first week as a separate division, turned out a record 10,634 cars, while Ford Division's market researcher, R. J. Eggert, observed that the "volume concept" has meant greater profit for auto dealers and lower prices to the customers. The "lower prices" part of it nobody will argue with.

Indicative of the Willys swing to jeeps is the report that sales of "commercial vehicles" are up 79 per cent over the same period last year, while registrations of the industry as a whole declined 2.6 per cent. Just announced also is a school for dealers near Pinckney, Mich. They will be trained in the operation and selling of the Willys jeeps and their attachments.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,026†	672,858
April	930,000*	676,248
May		621,262
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,884,989

Week Ended	1955	1954
Apr. 2	218,437	146,498
Apr. 9	207,089	152,086
Apr. 16	218,078	148,559
Apr. 23	225,074	157,710
Apr. 30	229,405†	159,206
May 7	225,000*	154,640

Source: Ward's *Automotive Reports*. †Preliminary. *Estimated by STEEL.

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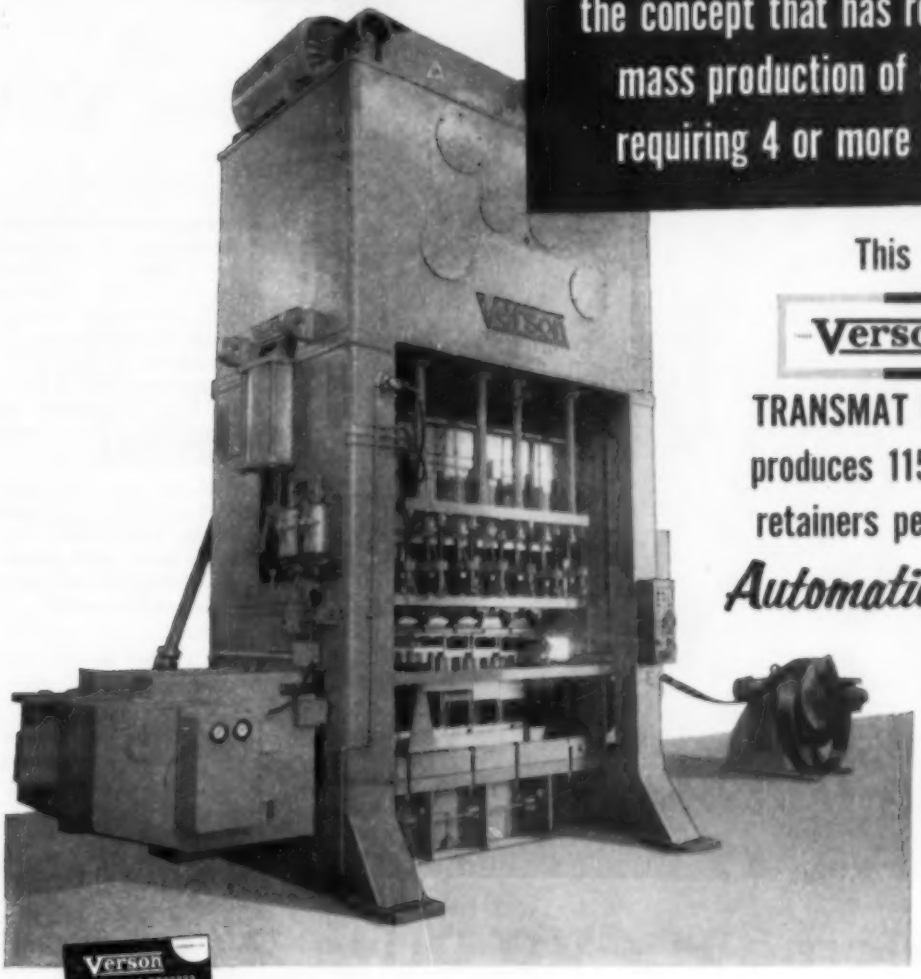

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If your daily requirements are 4,000 or more identical stampings involving four or more operations, it will pay you to investigate Verson Transmat Forming. For recommendations, send an outline of your requirements.

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More power—longer life—less space. Replacing a 14" belt used previously, a Morse HY-VO Drive —1" pitch and 2" wide—is used to pull a 72" heavy-duty lumber edger having Babbitt bearings. It transmits 100 HP at 1750 RPM. Normal operating time—9 hours per day, 5½ days per week. Result: greatly improved performance.

While lowering operation costs, the Kurth Lumber Company found that with this HY-VO Drive, they were able to use a much less expensive high-RPM motor; save critical space in drive width.

How Morse HY-VO Drive 2" wide replaces 14" belt in edger

When the Kurth Lumber Company, of Jasper, Texas, needed a long-lasting, dependable power transmission drive, they turned to Morse HY-VO Drives. Why? Because they found that HY-VO met all their power transmission needs; gave them more power, longer service life, and required less space.

Why don't you check into HY-VO Drives for your own applications? For a compact drive, with quiet operation even at velocities exceeding a mile a minute, you can't beat it. And HY-VO offers less than one per cent friction loss, 50% longer service life, and a reduction in cost per operating hour by as much as 50%.

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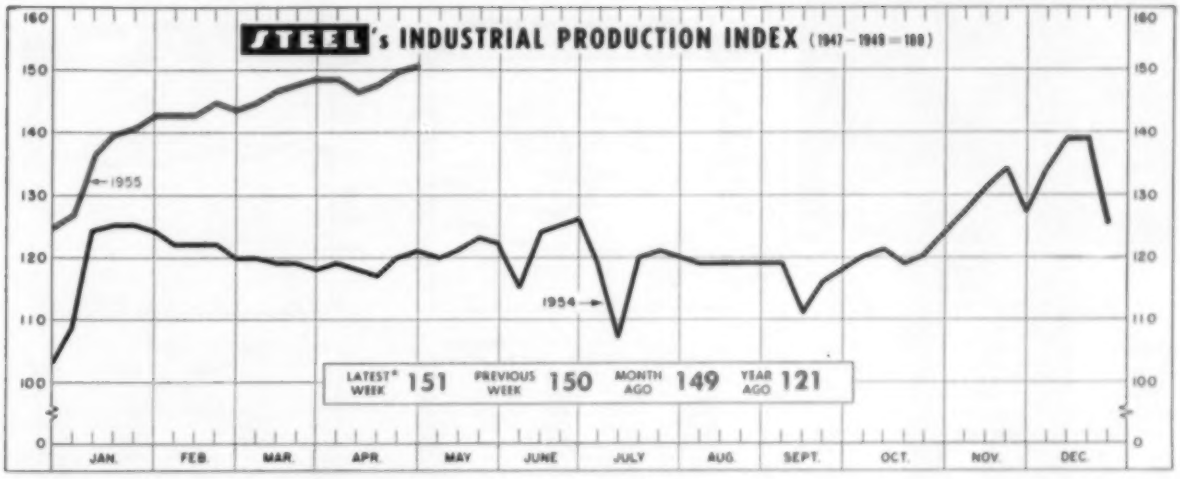


*Week ended Apr. 30. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

Industrial Production Index Hits All-Time High

INDUSTRIAL OUTPUT, paced by steel and autos, hit an all-time high in the week ended Apr. 30 (see STEEL's production index). It may go up another point or two before the current upward surge levels off.

Still rising steel production is one of the reasons for the record. Steel consistently has racked up week-to-week gains since the start of the year. Production of 2,307,000 tons in the week ended Apr. 30 was second highest weekly output in history.

Pace Continues—The American Iron & Steel Institute estimates last week's output at 2,328,000 tons, a new record. The old mark was 2,324,000 tons in the week of Mar. 23, 1953.

Probability of a sharp dropoff is slim. Most companies are confident they will operate at good rates the rest of the year.

Autos Speed—U. S. auto plants, too, are working at a record pace. Combined auto-truck output hit a new weekly high two weeks in a row. No slackening is looked for in May, says *Ward's Automotive Reports*.

The three-millionth car of 1955 came off the lines last Thursday. Truck production is strongest in two years. But after the end of the month, any further record busting depends on what cards Walter Reuther deals at Detroit conference tables.

Upturn Due—As far as other factors in STEEL's index are concerned: Electric output is in its usual spring dip. An upswing usually comes in June. Freight car loadings are ahead of last year but still under 1953. Coal, coke and ore shipments are showing considerably more strength than a year ago.

Bustling construction continues. In the latest week reported by *Engineering News-Record* heavy construction contract awards hit $459 million, the second largest weekly dollar volume this year. The total for the first 17 weeks of this year is $5.8 billion, 49 per

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,328	2,307	1,654
Electric Power Distributed (million kw-hr)	9,650[1]	9,697	8,390
Bitum. Coal Output (1000 tons)	8,600	8,475	1,123
Petroleum Production (daily avg—1000 bbl)	6,830[1]	6,832	6,622
Construction Volume (*ENR*—millions)	$458.5	$382.8	$241.1
Automobile, Truck Output (*Ward's*—units)	229,405	225,074	159,206
TRADE			
Freight Car Loadings (1000 cars)	708[1]	706	648
Business Failures (Dun & Bradstreet, no.)	201[1]	204	234
Currency in Circulation (millions)[3]	$29,657	$29,714	$29,645
Dept. Store Sales (changes from year ago)[3]	+10%	−13%	−2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,651	$20,873	$19,157
Federal Gross Debt (billions)	$277.0	$277.0	$270.1
Bond Volume, NYSE (millions)	$20.9	$23.7	$19.1
Stocks Sales, NYSE (thousands of shares)	12,881	14,473	11,202
Loans and Investments (billions)[4]	$84.9	$84.8	$78.9
U. S. Govt. Obligations Held (billions)[4]	$34.1	$34.1	$31.5
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index[6]	237.1	237.3	213.3
All Commodities[7]	110.4	110.3	111.1
Commodities Other Than Farm & Foods[7]	115.8	115.8	114.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

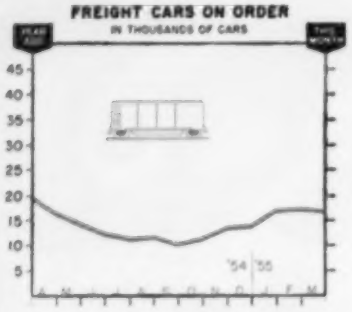
WHEN IT'S
Special BOLTS
and STUDS
Send your Specifications to
ERIE
40 years' experience in making special bolts, studs, nuts for specific job requirements.

Specialists in Precision High Quality
CONNECTING ROD BOLTS

REPRESENTATION IN PRINCIPAL CITIES

THE BUSINESS TREND

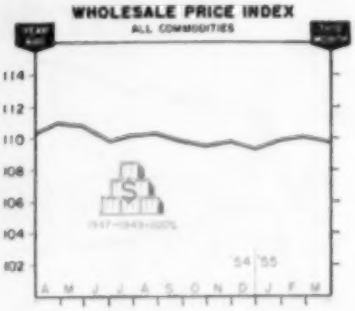
FREIGHT CARS ON ORDER
IN THOUSANDS OF CARS



	Awards		Backings (end of month)	
	1955	1954	1955	1954
Jan.	5,667	2,942	18,395	27,959
Feb.	2,690	2,057	18,633	25,441
Mar.	2,156	348	17,974	20,966
Apr.	....	909	.....	17,817
May	....	1,071	.....	15,615
June	....	1,129	.....	13,860
July	....	883	.....	12,589
Aug.	....	2,425	.....	13,013
Sept.	....	2,396	.....	11,993
Oct.	....	2,704	.....	12,853
Nov.	....	3,754	.....	14,805
Dec.	....	2,655	.....	15,317
Total	....	23,313		

American Railway Car Institute.
Charts Copyright 1955 STEEL.

WHOLESALE PRICE INDEX
ALL COMMODITIES



	1955	1954	1953
Jan.	110.1	110.9	109.9
Feb.	110.4	110.5	109.6
Mar.	110.0	110.5	110.0
Apr.	....	111.0	109.4
May	....	110.9	109.8
June	....	110.0	109.5
July	....	110.4	110.9
Aug.	....	110.5	110.6
Sept.	....	110.0	111.0
Oct.	....	109.7	110.2
Nov.	....	110.0	109.8
Dec.	....	109.5	110.1

U. S. Bureau of Labor Statistics.

cent ahead of 1954 and 13 per cent above 1953's all-time high.

Industry Builds—Current high levels of construction reflect an expansion of industrial and other nonresidential building, which is comparable in scale with the much more widely publicized increase in building, says George Cline Smith, economist for F. W. Dodge Corp.

Building Boasts Broad Base . . .

Contract awards in March for industrial construction in the 37 eastern states totaled $176 million, an increase of almost 120 per cent over March of last year.

In the first quarter, Mr. Smith reports, industrial awards ran nearly 26 per cent ahead of the same period of 1954. That's the first substantial upturn in the industrial category since it dropped from a peak in 1951.

Predictions generally had the upturn coming in 1956, but it apparently has been moved forward by the rapid improvement in business the last few months.

The rise is not a fluke nor is it confined to one or two large industries, Mr. Smith continues. In March, 17 of the 24 categories of manufacturing buildings reported by Dodge showed increases over last year. For the quarter, 14 made gains.

Booming construction is reflected in rising sales of building materials—compared with those in the first quarter of last year, they've increased 10 to 15 per cent, says Lawrence Schacht, president, Schacht Steel Construction Inc., New York. Though some structural steel is scarce, Mr. Schacht says: "No builder has to fear any delay because we are keeping schedules and delivery dates as usual."

Business Gains Continue . . .

Metalworking trade associations report on improved business: The American Gear Manufacturers Association says volume is up 16.4 per cent in March over February. The March index is 172.8 (1947-1949 = 100); a year ago, 128.6.

Business in the industrial heating equipment industry continues good, reports Carl L. Ipsen, executive vice president, Industrial Heating Equipment Association Inc. Orders for furnaces and ovens are up 61 per cent over the like 1954 period; for induction and dielectric heating equipment they are up 76 per cent.

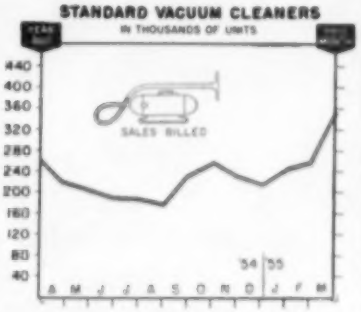
First-quarter shipments of re-

CONSUMERS' PRICE INDEX
COST OF LIVING

	1955	1954	1953
Jan.	114.3	115.2	113.9
Feb.	114.3	115.0	113.4
Mar.	114.3	114.8	113.6
Apr.	....	114.6	113.7
May	....	115.0	114.0
June	....	115.1	114.5
July	....	116.2	114.7
Aug.	....	115.0	115.0
Sept.	....	114.7	115.2
Oct.	....	114.5	115.4
Nov.	....	114.6	115.0
Dec.	....	114.3	114.9

U. S. Bureau of Labor Statistics.

STANDARD VACUUM CLEANERS
IN THOUSANDS OF UNITS



	Sales Billed—Units		
	1955	1954	1953
Jan.	250,123	221,233	255,886
Feb.	262,651	199,035	246,007
Mar.	358,179	276,464	329,294
Apr.	.....	220,849	268,548
May	.....	209,434	252,404
June	.....	195,781	197,506
July	.....	193,607	159,446
Aug.	.....	185,397	188,536
Sept.	.....	238,235	227,253
Oct.	.....	263,197	249,383
Nov.	.....	237,882	216,227
Dec.	.....	217,022	190,773
Total	.....	2,658,136	2,781,263

Vacuum Cleaner Mfrs. Assn.

sistance welding machines are 16 per cent higher than a year ago, says the Resistance Welder Manufacturers' Association.

The Packaging Machinery Manufacturers Institute states: The backlog of unfilled orders at the first of the year was highest since PMMI began collecting industry figures in 1950.

Laundry Appliances Hit Peak . . .

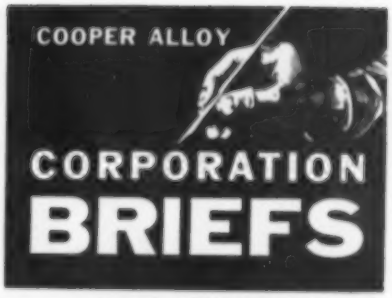
Factory sales of home laundry appliances in January-March were highest of any quarter in the industry's history. The first-quarter tally, according to Guenther Baumgart, executive director of the American Home Laundry Manufacturers' Association, was: Standard-size washers, 1,081,123 close to the all-time high of the third quarter, 1950; dryers, 338,096, second only to the fourth quarter, 1954; ironers, 24,639, highest since last quarter, 1953.

The factory hiring rate in March was up from February by the biggest margin since World War II, says the Labor department. Fabricated metals, machinery and electrical machinery were standouts.

The factory quit rate—sometimes used as an index of the worker's confidence in his chances of getting another job—also rose. It was most noticeable in industries that have shown a marked production pickup in recent months—primary metals, electrical machinery and transportation.

Trends Fore and Aft . . .

In the building and construction industries, outlays are at a high peak, and Mack units show an increased rate of sales gains, says P. O. Peterson, president, Mack Trucks Inc. Improvement also is noted in the prospects for increased sales of off-highway units . . . Orders received in the first quarter by Baldwin-Lima-Hamilton Corp. were over $57 million, more than double the same period of 1954, notes M. W. Smith, president . . . New orders in March were at near-record levels. The growing backlog of unfilled orders leads us to believe we will be producing at close to capacity well into the third quarter, reports John M. Curley, chairman, Eastern Stainless Steel Corp. . . . March was the fifth straight record month for business activity in the southern half of California, states the Security-First National Bank of Los Angeles.



• Edited by GEORGE BLACK

CASTINGS ON PARADE

This interesting folder presents a variety of stainless steel cast parts with information as to alloy, weight and application. It contains a complete data chart listing twenty-eight alloys with recommendations for their use.

AIRCRAFT PRODUCTS DIVISION

The COOPER ALLOY AIRCRAFT PRODUCTS DIVISION now under construction at Clark, New Jersey is fast taking shape. It won't be long before it will be turning out the vitally needed jet engine rings at increased production rates and with substantial savings in critical materials such as nickel, and chromium. The latest in methods and equipment have been selected to guarantee high speed, high quality production with minimum waste.

SHELL MOLD FILM AVAILABLE

For those interested in getting a first hand look at shell mold techniques a short film on the subject is available from our technical librarian Prepared by NBC cameramen for the National Association of Manufacturer's "Industry on Parade" television program, the film takes less than ten minutes, but it covers the ground pretty well.

BUY THROUGH DISTRIBUTORS

An interesting discussion on the function of the distributor in modern day marketing and the advantages to the consumer in doing business on a local level are covered in detail in a reprint from SALES MANAGEMENT magazine. Prepared by Cooper Alloy's Distribution Manager, C. L. Heintz, the article is of interest not only to sales managers but to purchasing agents and company executives as well.

COOPER ALLOY
CORPORATION • HILLSIDE, N.J.

precision demands the best material

The dependable quality of Hardtem Die Blocks is famous throughout the die sinking industry. Above is Mr. Larry Lucier, owner of the Commercial Die Co., in Detroit. Like so many other experienced die sinkers, Mr. Lucier uses Hardtem Die Blocks for the precision work that has earned his company's fine reputation.

That's why users buy and rely on Heppenstall Hardtem Die Blocks—for the consistent performance they can trust.

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Make Hardtem your standard die block specification. Heppenstall Company, Pittsburgh 1, Pa. Sales Offices in principal cities.

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. . . the most dependable name in die blocks

ARTHUR J. BUCKLEY
. . . Pangborn sales manager

Arthur J. Buckley was promoted to sales manager of **Pangborn Corp.**, Hagerstown, Md. He was assistant sales manager.

C. H. Kimmel was elected president, **Ohio Crankshaft Co.**, Cleveland, to succeed **W. C. Dunn**, cofounder and president since 1920, who continues as board chairman. **F. H. Pettay** was made senior vice president and treasurer; **M. J. Hoke**, vice president and general manager of the crankshaft and camshaft division.

Thomas W. Pettus was elected executive vice president of **Scullin Steel Co.**, St. Louis. He was vice president of American Brake Shoe Co., recently assigned to railroad sales, and previously president of National Bearing Division.

Frank A. Phillips was elected vice president-sales and **Arthur W. Reidinger** secretary of **Bay City Shovels Inc.**, Bay City, Mich.

Burton N. Wright was promoted from sales representative to St. Louis district sales manager for **Laclede-Christy Co.**, division of H. K. Porter Company Inc.

Mueller Brass Co., Port Huron, Mich., elected **A. C. Dappert** vice president-sales; **Frank M. Levy**, vice president in charge of research; and **Ernest Schleusener**, vice president-manufacturing.

EDMOND A. NEAL
. . . Nicholson File sales v. p.

Nicholson File Co., Providence, R. I., elected **Edmond A. Neal** vice president-domestic sales. He was domestic sales manager since 1950. Other new officers: **Stanley Livingston Jr.**, vice president-operations; **Charles E. Fogg**, vice president and secretary; **E. Blair LeFevre**, engineering; **Bruce R. Zeiser**, foreign sales; **Hugo Merk**, export manager and **B. J. O'Neill**, assistant secretary.

R. V. Davis was elected vice president in charge of sales, steel grating products division, **Bufnel Co. Ltd.**, Hollydale, Calif. He served A. O. Smith Corp. for ten years, most recently as national sales manager, hydraulic products.

Detroit Steel Corp., Detroit, promoted **Howard V. Clark** from sales vice president to executive vice president; **V. R. Bates** from sales manager for strip steel to sales vice president; and **A. D. Brown** from eastern plant manager to vice president in charge of plant operations.

Vincent P. Reinfeld was elected president of **Pyrosil Inc.**, Cuyahoga Falls, O.

Roy C. Ingersoll, president of **Borg-Warner Corp.**, Chicago, assumes the title of president and chairman. The latter post has been vacant since the death of **C. S. Davis** in July, 1954.

JOSEPH H. BASCOM
. . . president, Broderick & Bascom

Joseph H. Bascom, executive vice president and treasurer, was elected president of **Broderick & Bascom Rope Co.**, St. Louis. He succeeds **C. E. Bascom**, now chairman. **Stanley R. Brenner**, vice president-operations, was elected a director. **A. A. Grosse**, secretary and assistant treasurer, was made secretary-treasurer.

Roger E. Gay, president, was elected chairman of **Bristol Brass Corp.**, Bristol, Conn., and given a leave of absence to serve as director of the division of cataloging, standardization, inspection and quality control in the office of the assistant secretary of defense (Supply & Logistics), Washington. Mr. Gay succeeds as chairman **C. T. Treadway Sr.**, who continues a director. During Mr. Gay's absence, the executive committee and board of directors will direct Bristol Brass, with **Joseph O'Brien**, vice president and general superintendent, as operating head.

E. F. Blades, production manager at **Rheem Mfg. Co.'s** Houston plant, was promoted to works manager. **B. J. Gilliam** was promoted from acting plant engineer to plant engineer.

Harold M. Schudt was elected president, **Canadian Allis-Chalmers Ltd.**, Montreal, Que., to succeed **Mark C. Lowe**, resigned. The general machinery division of Allis-

RICHARD R. DEAS JR.
. . . Hamilton Foundry v. p.

HOWARD S. BUNN
. . . Union Carbide executive v. p.

FRANK L. MAGEE
. . . Alcoa executive v. p.

Chalmers Mfg. Co., the parent firm, is in charge of the Canadian operation.

Richard R. Deas Jr., works manager, was elected to the new office of vice president, **Hamilton Foundry & Machine Co.**, Hamilton, O. He now serves in both capacities.

Pyle-National Co., Chicago, elected **William C. Croft** president to succeed **Harold V. Engh**, who resigned but remains a director. Mr. Croft was executive vice president. He also was elected a director to succeed **Donald S. Boynton**, retired.

Harold V. Engh was elected president and chief executive officer of **Turner Brass Works**, Sycamore, Ill. He succeeds **John Slezak**, resigned. Mr. Engh was executive vice president of Anaconda Wire & Cable Co. before becoming president of Pyle-National Co., Chicago, eight years ago.

Harry C. Stanton joined **Robert H. Newton Co.**, Cleveland, as a manufacturers' representative for forgings, castings and springs. He was with Hamilton Steel Co.

Lincoln Engineering Co., St. Louis, elected **Carl H. Mueller** vice president-engineering and **John E. Renner** vice president-sales. Mr. Mueller was engineering director; Mr. Renner, general sales manager.

Stanley R. Rich was made technical director of **General Ultrasonics Co.**, Hartford, Conn.

Howard S. Bunn was elected executive vice president and member of the executive committee of **Union Carbide & Carbon Corp.**, New York. He was vice president and became a director in 1954. **Dr. Augustus B. Kinzel** was elected vice president-research to succeed **Dr. George O. Curme Jr.** who remains a director.

American Smelting & Refining Co., New York, elected **R. Worth Vaughan** executive vice president and **Oscar S. Straus** vice president and treasurer. Mr. Vaughan, former vice president, continues as general counsel and as a director of the company.

Frank L. Magee, director, vice president and general production manager for **Aluminum Co. of America**, Pittsburgh, was elected executive vice president. **Richard E. Coulter** was named an assistant treasurer.

Gilbert T. Coovert, general manager of V & O Press Co., division of **Emhart Mfg. Co.**, Hudson, N. Y., also was named general manager of the Henry & Wright Division in Hartford, Conn.

Walter R. Fry was made general superintendent and **Fred A. Grover** secretary of **Slinger Foundry Co. Inc.**, Slinger, Wis. Mr. Fry was superintendent and consultant at

R. WORTH VAUGHAN

OSCAR S. STRAUS

. . . promotions at American Smelting & Refining

Bruce Foundry reports on 13 years' operation

"BETTER CASTINGS FROM BETTER CORES WITH CITIES SERVICE CORE OIL"

PRESIDENT WILLIAM J. BRUCE is high in praise for Cities Service Core Oil. Says it prevents premature collapsing, eliminates sticking, permits minimum smoke and offers absolute uniformity. Great in every respect.

Located in Tecumseh, Michigan, Bruce Foundry and Mfg. Co. has a melting capacity of 30 to 40 tons per day. For many years Bruce has turned out top-notch castings for refrigeration and automotive hydraulic equipment.

And for thirteen of those years, Cities Service Core Oil has been a major factor in the quality and rapidity of Bruce's work. Probably no one is better qualified to comment on this oil than President William J. Bruce. Here's what he says: "One of the biggest reasons I can think of for recommending Cities Service Core Oil is its absolute uniformity. This we have discovered in every single order for 13 years. As for foundry performance, I don't think there's a better oil. It has high hot strength preventing premature collapsing, yet collapses rapidly at the right time so that sand doesn't have to be dug out of castings. In addition, it eliminates sticking and permits minimum smoke."

If you'd like to learn more about the oil Mr. Bruce praises so highly, talk to a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N.Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

AFTER REMOVAL FROM CORE BOX, sand core gets attention from skilled technician at Bruce Foundry. Firm makes castings for automotive and refrigeration hydraulic equipment, has used Cities Service Core Oil for 13 years.

JAMES C. BLACK
. . . Reynolds reduction div. mgr.

WALTER F. SHEETZ
. . . president, R. C. Mahon Co.

ROY F. SCHUMACHER
. . . Bethlehem Pacific sales post

Guilford Foundry Co., Greensboro, N. C. Mr. Grover was purchasing agent at Slinger.

James C. Black, general manager of the eastern reduction division of **Reynolds Metals Co.,** was made general manager of the company's reduction division. He has headquarters in Richmond, Va.

Dr. Harold M. Sonnichsen, director, technical division, and a board member of **Permacel Tape Corp.,** New Brunswick, N. J., was elected a vice president.

Stanley M. Proctor Co., Cleveland, appointed **Harry W. McCracken** district sales engineer.

Samuel B. Weiss succeeds **A. W. Nathan,** retired, as president and treasurer of **Detroit Steel Supply Co. Inc.,** Albany, N. Y.

Thomas I. Stephenson Jr. was named manager of Tennessee operations for **Aluminum Co. of America** at Alcoa, Tenn. He succeeds **Ralph M. Ferry,** retired.

Walter F. Sheetz, executive vice president and sales manager, was elected president, **R. C. Mahon Co.,** Detroit. **R. C. Mahon,** founder and president of the company for 43 years, was elected chairman.

Howard C. Liebing was made sales manager of **National Tube Co.,** Cleveland. He was production control manager.

Julius C. Hydrick was made works manager, **Quaker Rubber Corp.,** Philadelphia, division of H. K. Porter Company Inc. He was works manager at Quaker from June, 1950, until November, 1951, when he was transferred to another Porter Division, Delta-Star Electric Co., Chicago, as works manager.

W. J. Brigham replaces the late **Harry Lilley** as Detroit district sales manager of **Timken Roller Bearing Co. John J. McGrann** fills Mr. Brigham's post as district manager at Cincinnati. **Ralph Preston** succeeds Mr. McGrann as Houston district manager.

Roy F. Schumacher, sales engineer at **Bethlehem Pacific Coast Steel Corp.'s** Los Angeles office, was made manager of sheet and tin plate sales. He has headquarters in San Francisco.

Cummins Engine Co. Inc., Columbus, Ind., elected **E. D. Tull** executive vice president; **R. B. Stoner,** vice president-personnel; **C. R. Boll,** vice president-sales; and **P. J. Every,** general sales manager.

Edgcomb Steel & Aluminum Corp., Hillside, N. J., elected **George L. Tillson** chairman and chief executive officer. He is succeeded as president by **Harry L. Edgcomb,** former vice president-sales.

William O. Sweeny was elected vice president-sales, **Arwood Precision Casting Corp.,** Brooklyn, N. Y.

George M. Colvill was made manager of the grating, welding rod and equipment division, **Tygart Steel Division,** Alton Inc., McKeesport, Pa. **H. W. Stacy** is office sales manager.

OBITUARIES...

Claude B. Schneible, 63, president, **Claude B. Schneible Co.,** Detroit, died Apr. 15.

W. Clement Boren Jr., 63, chairman of **Carolina Steel & Iron Co.,** Greensboro, N. C., died Apr. 24. He also was chairman of **Salem Steel Co.,** Winston-Salem, N. C.

Gordon W. Cameron, 60, vice president-treasurer, **Aluminum Co. of America,** Pittsburgh, died Apr. 29.

Harold M. Chapman, 55, president, **Caldwell & Ward Brass Co. Inc.,** Syracuse, N. Y., died Apr. 22.

Robert C. Woodward, 68, retired chief metallurgist for **Bucyrus-Erie Co.,** Milwaukee, died Apr. 20.

Carl F. Mayer, 59, president, **Carl A. Mayer Corp.,** Cleveland, died Apr. 20.

G. A. Grader, 55, president, **Bedford Tool & Forge Co.,** Bedford, O., died Apr. 25.

Shortest Turning Radius

——AT FARM BUREAU SERVICE, Clark's Y-20 Scoop rolls into boxcars to handle fertilizer. With the shortest turning radius of any machine on the market, a tight 71 inches, the Y-20 is unbeatable for handling packed material in cramped quarters. See for yourself . . . ask for a demonstration.

Full 60" Dumping Clearance

——AT AMERICAN MARSH PUMP, the Y-20 Scoop shovels molding sand into shaker. Here's *clean-up-ability* . . . close scraping of floors, corners and sides. The Y-20 Scoop has plenty of reach for high hoppers, has a 60" clearance under the lip, will easily dump into bins and hoppers 86" high. See an "action" demonstration.

Full Bucket Loads Every Time

——AT ALLIED PAPER MILLS, clay is handled 17% faster with Clark's Y-20 Scoop. Low-level hydraulic tilt-back guarantees full bucket loads every time, permits carrying in lowered position without spillage. There's plenty of power, plenty of traction—fully loaded, the Y-20 Scoop will climb a 14% grade. Ask for a demonstration.

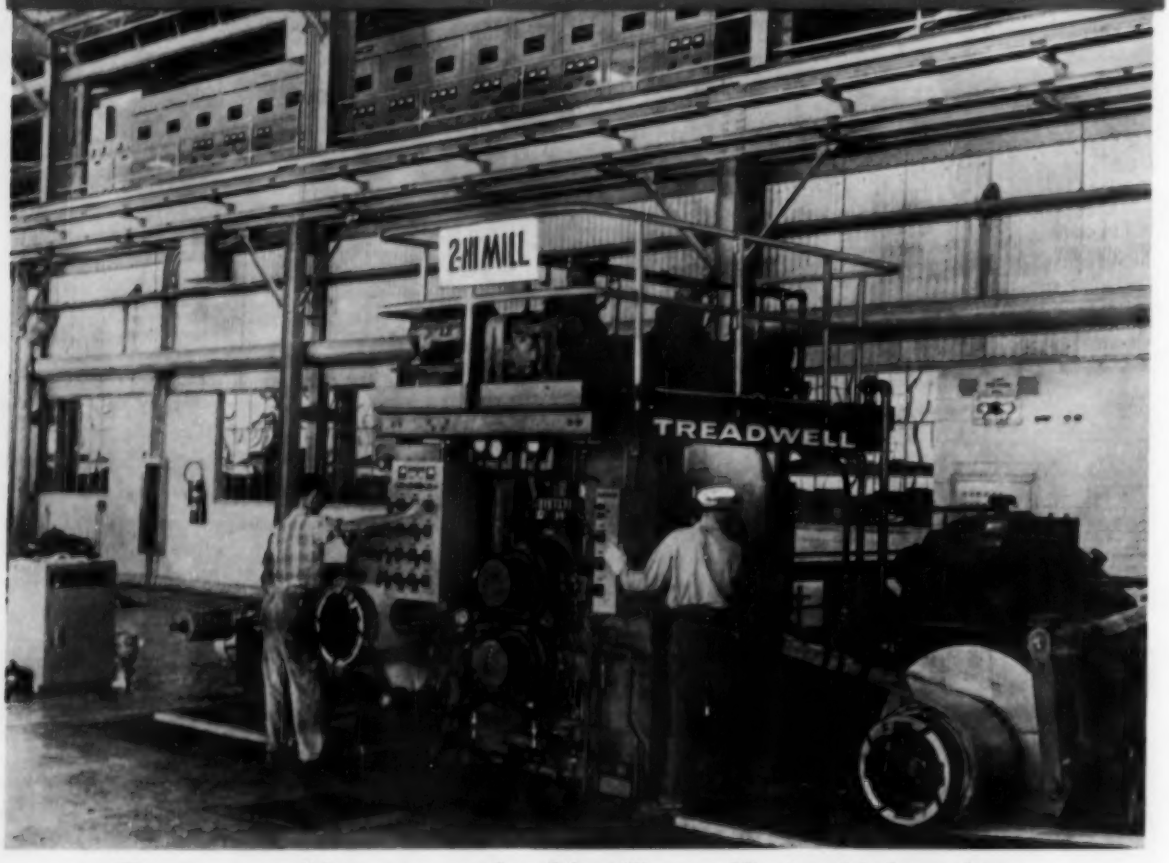
Dollar for dollar Clark's New Y-20 Scoop will outperform anything in its field.
Ask for a demonstration!

Industrial Truck Division, **CLARK EQUIPMENT COMPANY**, Battle Creek 26, Michigan

A BETTER BUY WITH LOCAL SUPPLY— *Genuine Clark Parts*

CLARK EQUIPMENT

Treadwell



Temper or skin pass and cold rolling mills for high carbon, stainless and carbon steel strip complete with coiling equipment.

Manipulators, Mill, etc.
Mills, Blooming & Billet
Mills, Merchant & Bar
Mills, Rod
Mills, Sheet
Mills, Strip (Cold)
Mills, Strip (Hot) & Skelp
Mills, Vertical Edging

Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Coilers & Reels
Conveyors, Coil
Drives
Ejectors, Furnace
Gauges, Shear, Saw, etc.

Beds, Cooling
Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Repeaters
Handling Equipment (Kick-offs, Pilers, Cradles, etc.)
Steel and Iron Castings
Ni-Hard and Ductile Iron Castings

BETTER GRADE MACHINERY

Treadwell Engineering Company

EASTON, PA.

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Plans To Build Foundry

Many operations of Chambersburg Engineering Co.'s new facilities will be mechanized

CONSTRUCTION of a large iron foundry has been started by Chambersburg Engineering Co., Chambersburg, Pa., to replace facilities which have been in operation since 1906. Production is expected to be shifted to the new building (without interruption in schedules) in October.

The new foundry's monthly capacity will be the same as the present one—750 tons. Part of the castings will be used in the manufacture of the company's forging equipment, with the remainder available to serve the needs of a growing number of casting customers.

Improved facilities will permit the economical production of 1000 to 60,000-lb castings. Present cement-bonded, sand-molding and coremaking methods will be used.

Mechanization—Many operations of the new foundry will be mechanized. Practically all foundry materials will be handled with electric trucks or conveyors. All melting will be done in cupolas, with melt materials weighed and handled mechanically.

All production operations will be performed in one bay, which will be served by one 60-ton and one 30-ton bridge crane and four 5-ton gantry cranes. Sand from shakeout and cleaning operations will be reclaimed and returned to storage by conveyor.

The new building will contain 48,000 sq ft of floor space. Adjoining facilities will include a large pattern shop and a 20,000-sq-ft yard storage area. It will be covered by a 10-ton bridge crane to handle materials and equipment.

Will Build Titanium Plant

Columbia - Southern Chemical Corp., Pittsburgh, will construct a multimillion-dollar, titanium tetrachloride plant at Natrium, W. Va. To be near the firm's chlorine and caustic soda plant, its construction will commence soon. Partial production is scheduled for April, 1956; capacity production, three months later. During World War II, Columbia-Southern provided commercial quantities of titanium tetrachloride to the government for military purposes.

Vickers Erecting Building

Vickers Inc., Detroit, is erecting a 150,000-sq-ft building to house engineering facilities, some executive and sales offices. Included is a research and development laboratory. Vickers builds oil hydraulic pumps, motors, cylinders and controls.

Bearings Producer Expands

Miniature Precision Bearings Inc., Keene, N. H., will triple production space by erecting a 50,000-sq-ft, air-conditioned plant. The project will be completed this summer.

White Motor Forms Division

White Motor Co., Cleveland, established a Special Products Division to handle the development and manufacture of a diversified line of nonautomotive products. Kenneth F. Ode, manager of government contracts, was appointed general manager of the division.

Los Angeles Firms Merge

American Electronics Inc., Los Angeles, acquired Pierson Electrical & Engineering Corp., that city. Pierson makes miniature, direct-current motors and generators and develops miniature power supply units for missile programs and electronic systems in the atomic energy field.

Ore Handling System Installed

E. J. Lavino & Co., Philadelphia, will install an ore handling system for unloading, storing, bedding and reclaiming ore for its stack at Sheridan, Pa. The system will be designed by Jay J. Seaver Engineers, Chicago.

Nottingham Steel Buys Firm

Nottingham Steel Co. purchased Cardinal Steel Supply Co. Both are Cleveland firms. George P. Lenz Jr., formerly president of Cardinal, has been appointed manager of flat-rolled sales for Nottingham in Cleveland. S. J. Sunday Jr., formerly sales manager of Cardinal, has joined Nottingham's sales staff. E. B. Crile will manage the Cardinal Steel Division as well as supervise Nottingham's

West Coast Foundry Puts Accent on Automation

General Metals Corp. is operating its new, $5-million foundry in Oakland, Calif. Designed to reduce labor costs, achieve faster, more efficient and higher quality production, it incorporates the utmost in mechanization. Versatility of production is assured by the layout of the plant, which permits a wide variety of work. Molds are shown being poured from a bottom-pour ladle

flat-rolled operations in Chicago, Detroit and Cleveland.

Wine To Flow in Cans

Canned wine will be marketed nationally beginning this summer, says Yosemite Winery Association, Madera, Calif. The container will be wax-lined, and cap topped. It was developed by Continental Can Co. Inc., New York.

GM Division Enters New Field

General Motors Corp.'s AC Spark Plug Division, Flint, Mich., has entered a new field—the design, development and production of jet engine control systems. Present work concerns controls for afterburners on several types of aviation engines. The project is concentrated in a recently leased building at 431 W. Florida St., Milwaukee. AC's main Milwaukee plant is at 1925 E. Kenilworth Place.

Revere Installs Aluminum Mill

Revere Copper & Brass Inc., New York, is installing a 4-high, 36-in., cold-rolling aluminum mill in its Canton, Md., plant. A number of supplementary auxiliary items are being added, including three additional natural-gas-fired furnaces for the heat treatment of aluminum. The mill is scheduled for operation by the Baltimore Division this fall.

Climax Realigns Sales Setup

Climax Molybdenum Co., New York, completely realigned and expanded its sales department. The reorganization entails the creation of three new domestic divisions, including direct sales, metallurgical market development and chemical market development. Reuel E. Warriner, vice president in charge of sales, says the program was undertaken to bring about a closer coordination of the over-all sales effort of the company and to provide greater and more complete commercial and technical customer services. It also takes into account the increasing spread of various forms of molybdenum into other than metallurgical applications, as well as the advancing use and expanding technology of molybdenum as a base metal and alloying material.

To Distribute Magnesium Items

Brooks & Perkins Inc., Detroit, appointed Continental Metals Inc., Los Angeles, as warehouse distributor for magnesium mill products.

Arrow Needle Boosts Capacity

Arrow Needle Co., a subsidiary of Textile Machine Works, Reading, Pa., is building another plant at Manchester, N. H., increasing its floor space from 17,000 to more than 27,000 sq ft.

ASSOCIATIONS

The Northern Ohio Chapter of the American Steel Warehouse Association, Cleveland, elected officers for 1955-56: President, G. H. Kuhnle, Peninsular Steel Co.; vice president, W. R. Holmes, U. S. Steel Supply Division, U. S. Steel Corp.; secretary-treasurer, W. H. Peterson, Republic Structural Iron Works; chapter director, A. D. Messner, Betz-Pierce Co., all of Cleveland.

American Society of Civil Engineers, New York, named W. H. Wisely executive secretary. He succeeds Col. W. N. Carey.

The American Iron & Steel Institute, New York, will stage its 63rd general meeting at the Waldorf-Astoria hotel, that city, May 25-26. At the opening session, the Charles M. Schwab Memorial Lecture will be delivered by Dr. L. A. DuBridge, president, California Institute of Technology, Pasadena, Calif. Technical and public relations sessions are scheduled for the afternoon. Addresses at the May 26 morning session will be delivered by Max D. Howell, executive vice president of the institute; Arthur B. Homer, president, Bethlehem Steel Co., Bethlehem, Pa.; and Claude Robinson, president, Opinion Research Corp., Princeton, N. J. The industrial relations session is scheduled for the afternoon and the annual dinner for the evening.

Granville M. Read, chief engineer, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., received the ASME medal, at the spring meeting of the **American Society of Mechanical Engineers,** New York.

NEW ADDRESSES

City Steel Co., Baltimore, an ornamental ironworks, is moving into larger quarters at 1446 Stevenson St., Baltimore, Md.

The eastern regional sales office of **Alloy Tube Division, Carpenter Steel Co.,** is now at the division's home office and mill in Union, N. J. The office was in Newark, N. J. Paul E. Kelly continues as eastern regional sales manager. It was stated incorrectly in the Apr. 25 issue of STEEL that the parent company's eastern regional sales office had been moved.

Marine Electronics Inc., manufacturer of electrical specialties, moved into larger quarters at 1510 Guilford Ave., Baltimore, Md.

Eastern Metal Products Corp. opened its executive offices and display rooms at 18 E. 41st St., New York 17, N. Y.

Insul-Mastic Corp. of America is transferring its home office from Pittsburgh to its plant, 7750 W. 61st Place, Summit, Ill.

West Metal Works Inc. is moving to 191-205 Dutton St., Buffalo, N. Y., as part of a $100,000 expansion program. New rolling and shearing equipment is being installed in the plant.

U. S. Industries Inc. announces that its New York and Chicago executive offices are now located at 250 Park Ave., New York, N. Y.

National Machine Tool Builders' Association moved to 2071 E. 102nd St., Cleveland 6, O.

A pencil pokes through this corroded metal! Why chance trouble like this? Cathodic Protection and Anaconda Type CP Cable effectively check corrosion of buried metals.

CHECK CORROSION by cathodic protection with Anaconda Type CP Cable

Corrosion of buried metals costs industry over a *billion dollars a year!*

But most of this can now be prevented—by Cathodic Protection.

Corrosion—caused by minute electric currents flowing from metal into adjacent soil—is checked by applying direct current from an external source. This eliminates anodic areas, makes the entire metal surface cathodic and stops the flow of current from the metal.

But moisture, oil, acids and alkalies often found in corrosive soil areas are tough on cable.

Because of our many years of experience with buried cable, Anaconda has been able to produce a new Type CP cable – specially designed with double jacket of polyethylene and Densheath* (PVC) – to resist these enemies of cable life. This means less replacement . . . major savings in both labor and material costs.

Would you like more information on how Cathodic Protection checks corrosion?. . . and detailed information on Anaconda Type CP Cable? Ask the Man from Anaconda – or send for bulletin DM 5450, "Anaconda Cathodic Protection Cable." Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

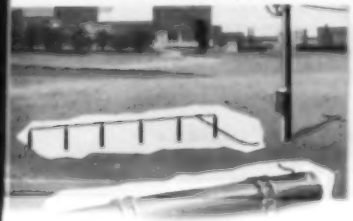
* Reg. U. S. Pat. Off.

ANACONDA®

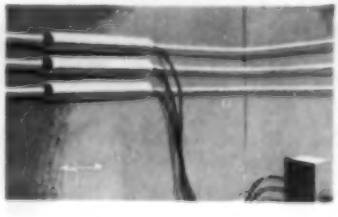
COPPER AND ALUMINUM WIRE AND CABLE

Where Anaconda Type CP Cable and Cathodic Protection Cut Corrosion Costs.

Gas mains and water pipes



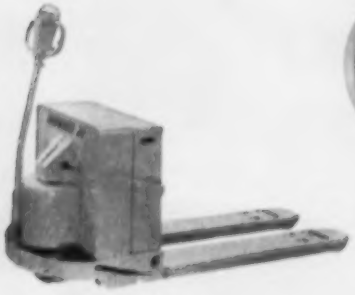
Lead-covered cable

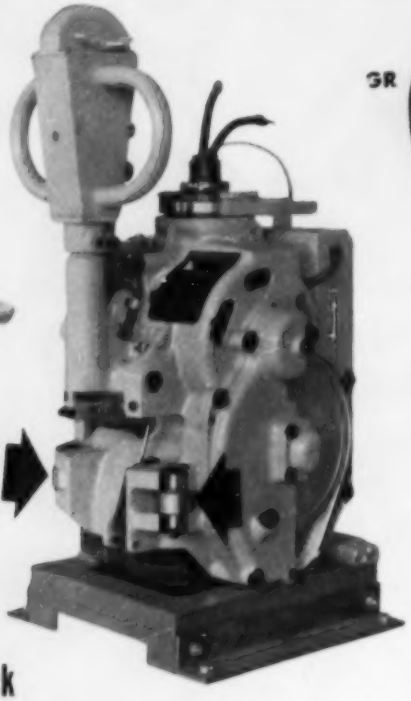


Underground storage tanks

Transmission towers

McGILL BEARING BRIEFS





Sealed GUIDEROL® bearings meet design demands of Clark *POWRWORKER* hand truck

The power head in Clark Equipment Company's Powrworker trucks required a bearing to provide radial support to the wheel-mounted pivoting drive unit. In addition it had to seal out dirt, carry a sizeable load in limited space and adapt to vertical mounting. Sealed GUIDEROL bearings meet each of these requirements.

For instance, the bearings are only 4½ inches above the floor and in contact with contaminating materials such as dirt, chemicals and brine that would freeze up ordinary unsealed bearings. Use of the Sealed GUIDEROL bearings eliminates the need for multiple parts and extra machining of the housing that would be required with auxiliary sealing of an ordinary bearing.

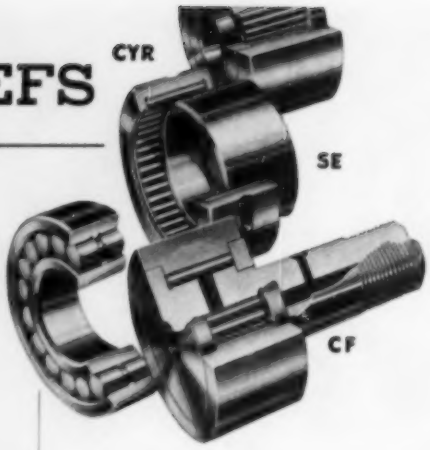
Although limited in size by the fit of the unit into the truck, the GUIDEROL SG Bearings take loads up to 1,500 pounds in absorbing starting and stopping inertias of the truck and the unit.

The SG Series bearings operate perfectly and last longer in vertical mounting because the center guided construction provides a guide rail that keeps the grooved rollers in alignment under any load from vertical to horizontal. They are available with built-in single and double seals with no increase in standard Guiderol bearing width.

To help insure product performance and to simplify production and assembly, investigate Sealed GUIDEROL Bearings today.

FOR YOU

Complete details on the Sealed GUIDEROL Bearing are contained in McGill Catalog No. 52. Send for a copy today.



SIKORSKY USES SEALED GUIDEROL® BEARINGS in HELICOPTER ROTORS

An obvious "must" for helicopter rotors is dependability. McGill Sealed GUIDEROL Bearings help to provide that dependability as drag hinge and flapping hinge bearings in the main and tail rotors of the Sikorsky S-55, helicopter series.

SEALED GUIDEROL® BEARINGS BRING NEW LATITUDE in DESIGN to SCOTT-ATWATER MOTORS

Used as crankshaft support in the new Scott-Atwater Bail-a-matic outboard motor line, Sealed GUIDEROL bearings give more positive seal retainment, make higher operating speeds possible, give greater capacity for future horsepower increases, and simplify assembly.

50th Anniversary

Insure performance with McGILL® . . .

MULTIROL®—GUIDEROL®—CAMROL® full type roller bearings

McGILL MANUFACTURING COMPANY, INC., 301 N. LAFAYETTE ST., VALPARAISO, INDIANA

STEEL

May 9, 1955

Technical Outlook

LEAD-ZINC SITUATION—For domestic lead and zinc producers, 1954 was the worst year since before World War II, but on a world-wide basis a new consumption record was established—and production exceeded consumption. U.S. consumption of both metals, compared with former years, was at a level considered satisfactory. Overexpansion of production during the Korean conflict created the oversupply, and the effects are still being felt, though 1955 should bring a definite upswing.

EXPANDING—The Steel Founders' Society is working on a method to make low carbon steel castings in shell molds. First plant tests, just completed, look promising.

INDUCTION GIANT—Biggest low - frequency induction heater built by Magnethermic Corp. will handle magnesium billets or rectangular slabs up to 32 in. in diameter by 71 in. long. It is rated at 2000 kw, (operates on 4160 v, 3 phase, 60 cycles) and will heat 10 tons of magnesium an hour. Eight freight cars were needed to ship it to Madison, Ill.

INSIDE EYE—Even former platoon sergeants will be surprised by the latest task for the wartime snooperscope. Being used to reveal the internal structure of metals by infrared radiation, it sees right through a silicon ingot several inches long, picking up contaminants, strains and crystal imperfections.

CUTS WEIGHT—An atomic reactor design that more than halves the weight per horsepower of conventional reactors and eliminates many moving parts is proposed by General Electric. The liquid metal reactor is nested inside a cylindrical heat exchanger. This eliminates the separate heat exchanger used to convert water into steam to drive turbine generators. It also does away with a lot of piping and valves. There is less open space, which must be shielded to protect personnel from radiation.

POROUS METAL—Sheet aluminum with pores as small as 5 microns or as large as 150 is available in experimental quantities from Micro Metallic Corp., Glen Cove, N. Y. It's made by powder metallurgy techniques, and should find use as a filtration and gas-dispersion medium in chemical, aircraft and atomic energy fields.

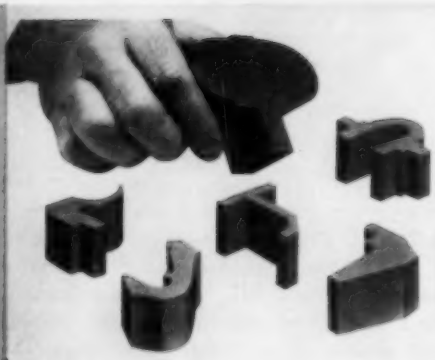
TITANIUM ETCH—Alkaline chemical milling is being used by North American Aviation Inc. to remove scale from titanium alloy forgings. The etch rate is controllable, making it possible to forge oversize, then bring parts to final dimensions by chemical cutting.

NONSTRATEGIC ALLOY—Thermenol is ready to go to work. Duraloy Co. of Scottdale, Pa., will make and market the Naval Ordnance development. It's a 16-Al, 3.5-Mo, Fe alloy with excellent resistance to oxygen and sulphur at high temperatures, high electrical resistance and excellent magnetic properties. Because its density is 15 to 20 per cent lower than most stainless steels, it ought to have numerous aircraft applications. STEEL gave details on Thermenol on Aug. 2 last year, page 88.

BOLT CORROSION—Electrical measurements in the laboratory can predict the corrosion rates of bolts used in underground structures, says the National Bureau of Standards. Some bolt materials can be protected against corrosion by making them cathodic to the structures they fasten.

Metalworking Outlook—p. 39 Market Outlook—p. 117

By ROBERT M. LOVE
Pittsburgh Editor



Variety is the spice of extrusion. Extruded shapes in carbon steel (left), stainless and high alloy steels (center) and aluminum alloy (right)

Extrusions Put Squeeze on Costs

Here's metal that comes from the mill in shapes close to finished-part dimensions. Think of the gains in lower scrap loss, less machining time. The try-it-out cost is low

Extrusion's range is tremendous—from decorative trim to structural shapes like this husky aluminum aircraft member extruded by Alcoa

A SUGGESTION to substitute extruded aluminum for rotor wedges instead of machining them from bar stock won a worker $4000—the largest award paid by Westinghouse Electric Corp. in 1954.

The idea isn't unique. Industry in general is switching to extrusions to save machining dollars. Further: Parts are being redesigned to cash in on the advantages of the process: Low cost, fast delivery, superior physicals and shapes dimensionally close to the cross section of the finished product.

Rising Star—Last year, the tonnage of aluminum extrusions shipped topped shipments of aluminum castings for the first time. The growth was termed "startling," by Alcoa officials, prompting predictions that more extrusion presses will be installed.

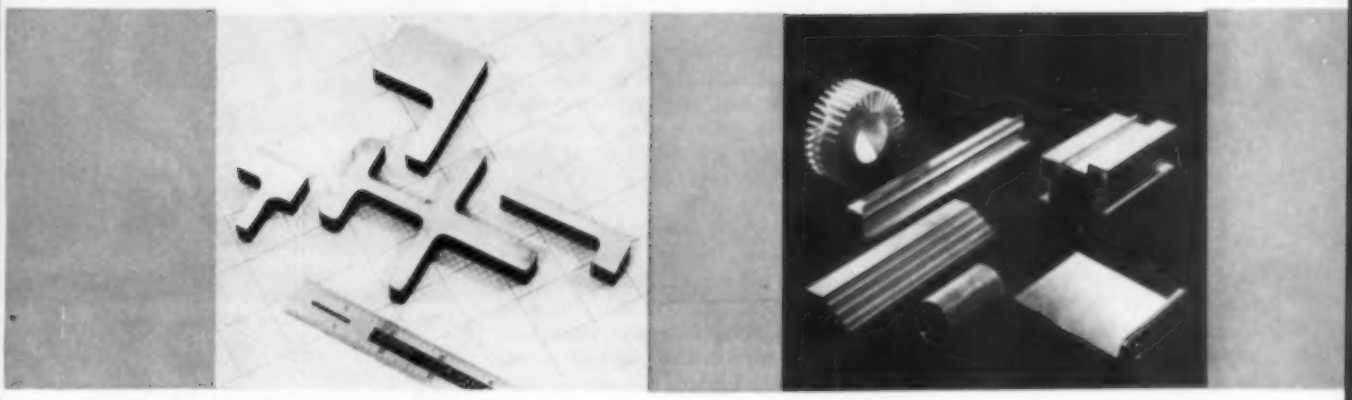
Tailor-made shipments of extruded steel are coming from mills which once specialized in blooms, billets and slabs. An understanding of fabricators' requirements started this trend.

Magnesium also shares in the demand for tailor-made metal. "Extrusions give the fabricator wide latitude in planning special sections," Dow Chemical Co. points out. Units once assembled in sections and joined by fasteners can be extruded in one piece.

Hot Squeeze—Extruded shapes are produced by slowly forcing billets through a steel die under hydraulic pressure. Extrusion temperatures for aluminum range from 650 to 950° F, depending on the alloy. Steel must be extruded at 2100 to 2300° F.

High temperatures and pressures on dies (four to five times greater than those required for aluminum) delayed development of steel extrusion. After World War II, the French Ugine-Sejournet process made possible the economical extrusion of hollow and solid steel sections. Using this process, the tube division of Babcock & Wilcox Co. launched the extrusion of high-alloy tube in January, 1952.

B & W now is far beyond the French fundamentals. Die design,



ingot heating and presses are improved.

Competition—Allegheny Ludlum began operating a hot extrusion plant for making stainless steel seamless tube early in 1953.

Extrusion eliminated the need for conditioning inside surfaces after hot-piercing the tube. Quality improved. The greater flexibility of extrusion meant that the cold-drawing department could choose from a dozen sizes rather than four or five. Realizing that hot extrusion offered special advantages to customers, the company soon branched out into extruded shapes.

In June, 1954, it began taking production orders for extruded stainless shapes.

Similar Decision—Shortly after that, Jones & Laughlin Steel Corp. announced its entry in steel extrusion, and turned out its first hot shapes of carbon and alloy steel in February, 1955. "We see untold possibilities for extruded sections," says a J&L sales manager.

These glowing predictions hail the taking of a big step nearer steel consumers' needs. Aluminum producers had already taken it and sales were mounting. Now steelmakers asked: "What will the growth of steel extrusion mean to producers and consumers?"

Saving Time, Cost—Main advantage for steel users lies in eliminating the time and cost of machining and finishing. Extruded shapes can slash scrap losses and save valuable material. Lower tool cost follows. Extrusions may furnish shapes more intricate than those produced by rolling.

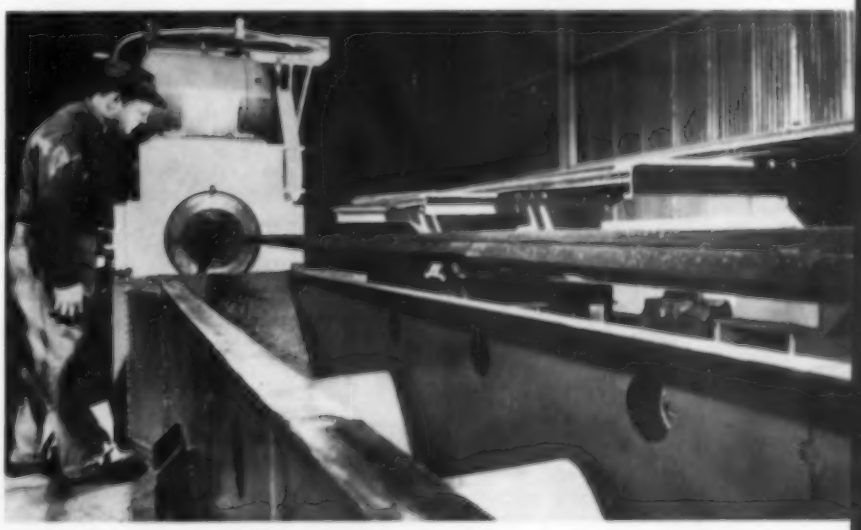
At the extremes, extrusion can produce tube in "unpierceable" alloys, reports B&W. That firm extrudes commercially pure titanium for heavy-duty applications such as aircraft. Zirconium and pure molybdenum can also be extruded.

Allegheny Ludlum adds: "Hot extrusion is especially helpful in the production of small amounts of special products. A rolling mill may lose production time in changing roll setups for orders below 10 tons." New shapes in small quantities are not economical when rolled. Added to the cost of producing minimum quantities is the expense of cutting new roll passes.

Concrete Savings—A producer of rings for aircraft gas turbines used to machine his products from a rectangular bar which was rolled and welded into a ring. Machining removed as much as 80 per cent of the metal. With extruded shapes, the ring is still rolled and welded, but sizing and machining are simple. Most of the metal has been removed in the extrusion.

An aircraft engine shroud manufacturer was machining a rectangular, stainless-steel bar weighing 20.4 lb per ft to a part weighing less than eight lb per foot. Extrusion furnished a shape weighing 7.94 lb per ft, almost the weight of the finished product.

For Specialties—H. M. Harper



Finishing touches: A stretcher-detwister takes kinks out of steel extrusion at Jones & Laughlin Steel Corp., Pittsburgh

Co. spent $2 million for melting furnaces and an extrusion mill. So far, production is going into the company's product, fasteners. Metal is bought in ingot form, alloyed if needed, recast into billets and extruded by the Ugine-Sejournet process.

Small Lots—Harper is experimenting with superalloys for fastener production, and is using a great number of alloys in small quantities for short production.

One big thing that this extrusion press meant for the company last year: It enabled it to reduce its metal inventory from about $1.5 million to about $400,000. Harper also can remelt its scrap. About 20 per cent of the metal it uses comes from scrap from its own operations, recast and put back into the extrusion mill.

Designable—Reynolds Metals Co. points out that extruded aluminum allows production of almost any shape desired by designers. Several standard rolled sections often can be replaced by a single extrusion, saving overlapping metal sections and the cost of joining.

Many aluminum consumers redesign their products to take advantage of this flexibility. Welded assemblies often can be redesigned to extrusions, with reduced cost and improved strength.

Alcoa holds frequent symposiums with engineers, showing them how to make best use of tailor-made aluminum. While dimensional tolerances are not so exact as those obtained by machining, the variety of shapes can't be matched by other production methods.

Phosphor Bronze—Other metals gain by extrusion. Riverside Metal Div. of H. K. Porter Company Inc. is making extruded, phosphor-bronze wire. The product meets such miscellaneous demands as eyeglass frames and valve springs for an electrical transformer.

Extrusion, replacing the cold working of high-tin phosphor bronzes, takes less time to make a better product, which has exceptionally high strength and resistance to fatigue.

Copper, Too—An air circuit-breaker part, made by I-T-E Circuit Breaker Co., contains an extruded copper shape originally milled from 1 x 2 in., rectangular copper bars. It weighed 7¾-lb per ft. Machining took off 1.8-lb of scrap per ft, so the firm switched to an extruded shape made by Revere Copper & Brass Inc. Scrap now runs less than 0.05-lb per ft.

Although the shape costs more per pound than the bar, reduction in weight was sufficient to save almost 44 cents per foot over the bar. Additional savings resulted from quicker production, less machining and scrap handling time.

Less Machining—Taylor-Winfield Corp. was machining a secondary pad for a resistance welder out of solid copper bar which cost $11.73 per ft. An extruded shape nearer the finished form weighed less and cost less (only $10.03 per ft) and cut machining time in half.

But there's an extra problem with steel extrusions. Potential savings are as large as they are with other metals, but few firms interested in steel extrusions can afford to change traditional methods overnight.

How extrusion saves stainless steel

A Chicago manufacturer is much interested in using extruded steel shapes. Having made parts the same way since 1906, he wants to save high labor and tool costs. He can't afford to make sweeping changes without thoroughly understanding what extrusions can do for his company.

Expert Advice Needed—Other firms agree. That's why extruders report a growing number of engineers are asking salesmen how they can redesign to take advantage of squeezed steel. Some discover extrusions can't be made in their size ranges, but many are adopting the new product after prolonged study.

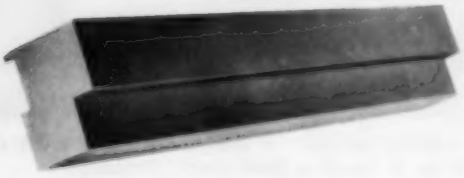
Many users of castings or forgings, or those machining solid bar stock to intricate cross section, can replace those methods with hot-extruded, cold-drawn sections at savings.

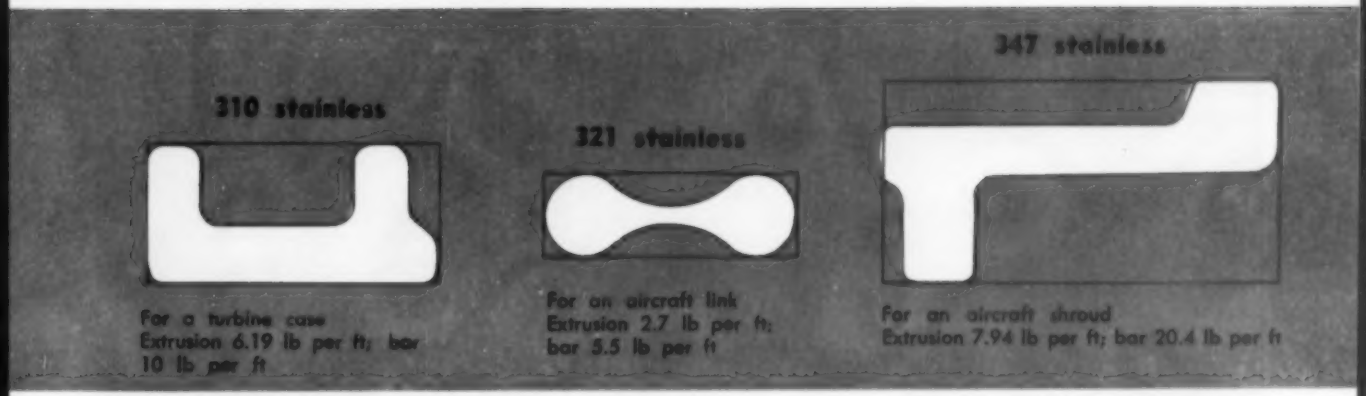
Many Customers—Promising present and potential markets: Business machines, electrical equipment, machine tools, air conditioners, compressors, small arms, automobiles and farm equipment.

A major field for stainless extrusions has been in rolled and flash-welded rings for aircraft components in stainless and high-temperature materials. Other important markets include canners, tool bit makers and tool and die makers.

Aluminum—New trailer models are using the light metal in extruded roof and side supports, flooring, door frames and window sections. Automakers may replace

Part for a high-frequency transformer, previously machined from bar, now made at a 26 per cent saving from the Revere copper extrusion at right




310 stainless
For a turbine case
Extrusion 6.19 lb per ft; bar 10 lb per ft
321 stainless
For an aircraft link
Extrusion 2.7 lb per ft; bar 5.5 lb per ft
347 stainless
For an aircraft shroud
Extrusion 7.94 lb per ft; bar 20.4 lb per ft

Allegheny Ludlum Steel Corp.

several pounds of stainless steel with aluminum next year in interior trim and door framing. Extruded, integrally stiffened, wide sections are finding big uses in aircraft and truck and trailer bodies. Railroad cars are another market.

To ease die pressure, some wide aluminum extrusions are made from slab-shaped billets, others from hollow billets. Wide extrusions are sometimes made as split cylinders and later flattened.

Homes and Looms—The architectural field uses window and door frame extrusions, truss members and stud sections for pre-fabricated houses. Consumption of extruded aluminum tube for siphons and sprinkler irrigation systems has doubled in each of the last two years.

In the textile industry, loom manufacturers are using aluminum extrusions in place of cast iron, steel and wood parts. Extrusions are a real saver for the special machinery field.

Steelmakers find themselves where aluminum producers were several years ago. They face the task of talking with engineers and purchasing agents unfamiliar with what extrusions can do. Much of their current sales effort is directed at acquainting industry with what's available and what the capabilities are. They won't worry about sales now: They'll sell the process first.

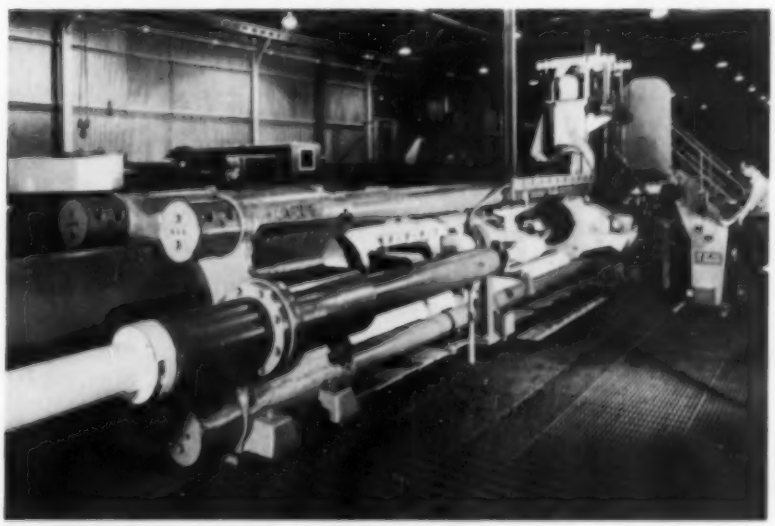
Deluge of Questions — "We're swamped with inquiries on applications," reports Babcock & Wilcox Co. Early in April a large electrical manufacturer invited both B&W and Allegheny Ludlum to its plant to look over parts to see if they could be extruded at savings in cost. That's the type of help industry needs, and is getting, from extruders.

Allegheny Ludlum also wants to be certain that customers understand and can evaluate extrusions before they place an order. One potential user has been testing sample extrusions from that firm for six months. Despite innate caution, sales are growing. By April, Allegheny Ludlum had made about 100 different extruded steel shapes.

Future Plans—With applications accelerating in nonferrous fields and beginning to climb in steel, producers are looking years ahead. They expect users to continue multiplying, with a corresponding increase in firms operating extrusion presses. Looking toward the future, Alcoa's Vancouver, Wash., extrusion facilities (opened in 1954) were designed to accommodate expansion smoothly.

Dow plans a new 13,200-ton press at its Madison, Ill., plant. Reportedly the world's largest for magnesium extrusions, it's expected to be operating in 1956.

Steel extruders are working toward better hot tolerances. They have to learn more about die design and lubricant application. There's a customer education job to do, too, but these are the normal growing pains of an industry with a future.



This 1000-ton press at Jones & Laughlin Steel Corp.'s new extrusion plant in Pittsburgh squeezes out complex sections of low-carbon steel bars. Lubricant is powdered glass

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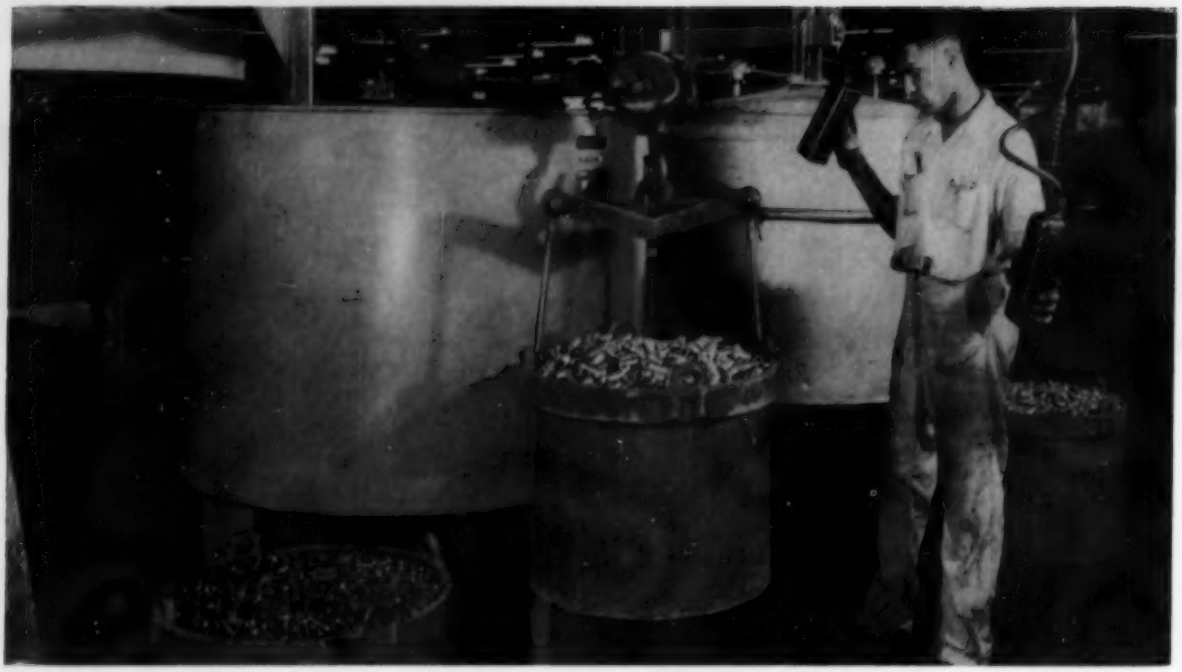

Steam Heat Treating Boosts Processing Efficiency

You can temper, anneal and stress relieve in steam atmosphere to get scale-free work. Method imparts wear and corrosion resistance, reduces finishing operations

By FRED L. SPANGLER
Leeds & Northrup Co.
Philadelphia

STEAM is doing an important heat-treating job in many plants.

It's used for scale-free tempering and stress relief, to lengthen service life of tools and cast-iron parts, for bluing and to improve compressive strength and hardness of powdered iron parts.

It gives parts better resistance to corrosion. It serves as a surface preparation for painting, japanning and lacquering.

With nonferrous metals, which are prone to scale in air atmosphere, steam inhibits oxidation to prevent scaling.

With ferrous metals, steam produces a thin, tightly adherent oxide coating. The depth of coating obtained with a 30-minute cycle (1025°F) is about 0.0001-in.

Longer Life—On high-speed steel tools, such as twist drills, broaches, reamers and taps, steam treating increases tool life. A steam tempering treatment should be the final step in manufacture, applied after finish grinding.

This increase in life is believed to be due to the finish obtained. It minimizes the tendency of particles of steel to weld onto the tool surface during cutting. A weld build-up in the flute of the drill increases friction during drilling and causes over-heating, which softens the cutting edge.

Holds Oil—Also, the porous oxide surface is a good retainer of cutting oil, probably another reason for increased life.

The beneficial results of steam treatment have been proved for tools used on ferrous metals, but the process is of questionable value where the tools are used to cut the softer nonferrous metals—aluminum, magnesium, brass and bronze.

Case in Point—Take twist drills made of the 18-4-1 and the 8-4-2 types of high-speed tool steels.

A batch of 200 to 1000 drills, weighing 75 to 500 lb, is heated to 700° F. The furnace is purged with steam for ½-hour at this temperature. Then the temperature is raised to 1000° F and held for 20 minutes, with a constant flow of steam to the furnace. After work is removed, it is cooled in air and dipped in light oil.

When used for drilling heat-treated alloy steel, these steam-treated tools have an average life about 100 per cent longer than untreated drills.

Helps Wear-In—Cast-iron parts, such as cams and bearings, valve tappets, pistons and piston rings,

show better wear and wearing-in properties because of steam treatment. The tough, porous, oxide film retains lubricants and helps cushion parts while they lap into perfect fit during the break-in. Oil retention in the film gives better corrosion resistance, too.

The corrosion resistance of steam-treated surfaces after oil dipping is considered equal to those treated by chemical oxidizing processes then oil dipped.

Parts such as bolts, either cold headed and strain relieved or hardened and tempered, are quenched directly into a soluble oil solution after steam treatment. Other parts are air cooled, then dipped in oil at a lower temperature. Reports on several salt-spray tests: From 14 to 40 hours elapsed before corrosion occurred.

Temper—Many plants temper or stress relieve parts in a protective steam atmosphere. This is particularly desirable in tempering bolts, aircraft structural parts and diesel, injection-system fittings.

Cold-headed bolts and deep-drawn parts, such as bearing cups, are strain relieved in steam atmosphere after cold working.

Besides being a scale-free tempering process, steam treatment gives a good surface finish and improves machinability. One user reports that stress relief of a cold-formed bearing shell in steam increased tool life on a subsequent machining operation 300 per cent.

The same user also reports that tempering alloy studs in steam gave a better surface finish (measured in microinches) in a subsequent grinding operation.

Former procedure was to stress relieve or temper in air atmosphere, then clean by shot blasting before machining or grinding.

Added Color—Because the oxide film given by steam treatment has a uniform, blue-black color, it has made a place for itself as a final finish on many parts.

A sewing machine manufacturer reports reduction of 25 per cent or more in the cost of obtaining a blue-black finish on its parts. The company says that because the iron-oxide film is so tightly adherent, the finish does not crack or chip in handling or service..

Steam-bluing replaced cadmium plating for a maker of postage meter parts. Result was closer-fitting, smoother-working parts and lower finishing costs. Trouble caused by deposits left in shaft holes disappeared.

Faster — When pickling is required prior to plating, painting or other surface finish on parts, such as hacksaw blades, die stocks, tap wrenches, etc., the uniformity and composition of the steam oxide coating gives shorter pickling time.

One user reports time for pickling, prior to plating, is 10 minutes for steam tempered bolts, versus 60 required when tempering was done in air atmosphere.

Powder Metallurgy—Steam treating does three jobs on powdered iron parts: 1. It increases hardness and compressive strength. 2. It improves corrosion resistance. 3. It increases wear resistance.

When the pores of a powdered-iron part are impregnated with an oxide film there is an increase in hardness. This means greater resistance to deformation.

Tests show that steam-treated, iron-powder parts have a yield point, under compression, about double that of regular sintered compacts. However, under tensile load the strength of the compact is somewhat less than before steam treatment.

Stops Corrosion — If powdered-iron parts are oil dipped after steam treatment, they show higher corrosion resistance. On bearing surfaces, for instance, where alternate heating and cooling results in moisture condensation, the oxide-impregnated part retains the oil and resists the effects of moisture.

The hard oxide surface also makes for better breaking-in of a part. After the original surface is worn away, the hard oxide surface in the pores is the one continually exposed.

Nonferrous Metals — On brass

Powdered metal parts are steam treated to get greater compressive strength and improved wear resistance

Solution treating these aluminum-alloy clutch arms in steam saves up to 40 per cent of the cost of subsequent buffing

and bronze, the chief advantage of annealing in steam is the elimination of pickling between cold-working operations. In many cases, the surface obtained by annealing in steam, then water quenching, is clean enough so that deep-drawn parts can skip the usual pickle and go directly to the next forming operation.

On brass parts that are stress relieved after machining or cold working (to prevent season cracking) the surface is usually clean enough so additional chemical cleaning is unnecessary. On parts to be plated, only a bright dip is required to remove the oxide film.

A maker of brass valve fittings, regulators and nozzles for acetylene torches now does all its stress relieving in steam. Parts are used "as is" after stress relief.

P-H Alloys—With beryllium copper, precipitation hardening in steam makes for easier cleaning prior to plating. A bright dip removes the oxide film and cleans parts for plating.

On several spring applications, two pickling operations, plus the bright dip, were required when air atmosphere was used. Steam treatment did away with pickling.

Easier To Buff—With aluminum alloys, solution treatment in steam gives a more uniform, more metallic and better reflective surface compared with the duller, matte finish obtained in air. This means steam treatment cuts finishing costs on parts that must be chemically or mechanically cleared after heat treatment.

In one case, steam-solution treating of aluminum clutch arms saved up to 40 per cent of the cost of subsequent buffing operations.

Cycles—Steam heat-treating cycles for ferrous metals usually consist of four steps:

1. Work is loaded into the furnace and preheated in air atmosphere, 650 to 750° F. This prevents condensation of steam on the cold work. 2. When the furnace reaches preheat temperature, it is purged of air as rapidly as possible by incoming steam. Purging time is about 30 minutes, and some 50 volume changes are required. 3. The load is then heated to the final treating temperature and soaked for the required time with steam flowing through the furnace. 4. Parts are removed from the furnace and either air cooled or liquid quenched.

Nonferrous—Here, the procedure changes slightly. A purge may or may not be required, depending on the characteristics of the load. If the parts have a light cross section and the load is small or light, best results are obtained by purging at a lower temperature, say about 400° F.

If parts have a reasonably heavy cross section and the load is heavy, the purge can be eliminated. The furnace is loaded at operating temperature, and steam is turned on immediately.

Equipment — You need an airtight furnace, preferably with forced circulation, a temperature control system and a good source of steam.

Batch-type furnaces designed for steam-atmosphere treating give good results. Leeds & Northrup makes an electric, forced, convection type that goes up to 1150° F. Steam is fed through an inlet in the bottom of the furnace and exhausts through a flapper valve in the lid.

Any reliable source of steam—a process steam line or a small electric or gas-heated generator—is satisfactory. For continuous production work, about 50 lb of steam per hour generally is required. Cost in most plants is a few cents per 100 lb of load.

Where Steam Treating Is Used

Product	Material	Process
	NONFERROUS METALS	
30 caliber shells	Brass	Annealing after progressive deep-drawing operations in fabrication
Valves, regulators, gas torch nozzles, fasteners, cosmetic containers, etc.	Brass or Bronze	Stress relieving after machining
Clips, springs, electrical components	Beryllium Copper	Precipitation hardening or aging
Instrument parts	Aluminum alloy	Solution treating
	FERROUS METALS	
Cams, bearings, valve tappets, pistons, piston rings, etc.	Cast iron	Controlled oxide coating
Saw blades, machine parts	Steel	Controlled oxide coating
Twist drills, taps, reamers, counterbores, punches, etc.	High-speed steel	Controlled oxide coating
Rotors and stators for hermetically sealed electric motors	Laminated silicon steel	Controlled oxide coating
Postage meter parts, sewing machine parts, guns, toys	Steel	Bluing
Gears, bushings, pistons	Powdered metal	Controlled oxide coating

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At start of operation, range top is placed on conveyor and moves to first press where it is stamped. Operator on other side of press places work on the next conveyor line

Parts Flow from Press to Press

A PORTABLE conveyor system is the key to higher production efficiency in the stamping room at RCA-Estate Appliance Co., Hamilton, O. Tops for electric and gas cooking ranges flow smoothly from press to press during stamping operations.

The equipment paid for itself in a month, say company officials.

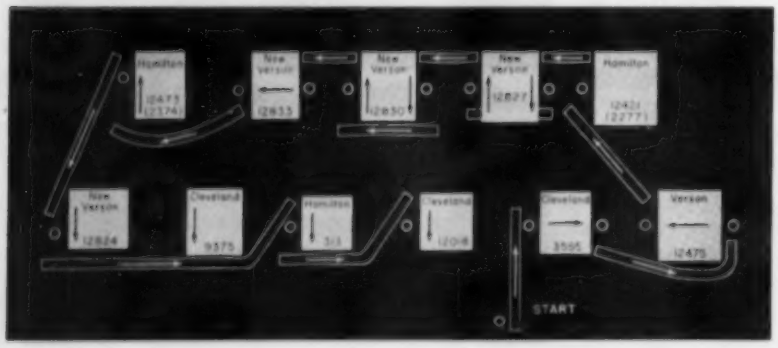
Before—The company used six-wheel carts and moved parts manually. That was time consuming and parts were often damaged during handling, making extensive re-work necessary to restore them to usable condition.

Conveyors and portable folding stands were set up to run from press to press. Sections slope slightly and rails are angled to route parts around corners and other obstructions.

Now—The press operator receives parts at his work station from a feed-in conveyor and sends worked parts to the next work station by placing them on the take-away conveyor. Since edges of the wheels, which overhang the rail, are smooth and round, handling damage has been eliminated. Length of the lines permits active storage banks between stamping operations.

Known as A-F Live Rail, the wheel conveyor is made by the Alvey-Ferguson Co., Cincinnati. It has individual rails which can be spaced widely apart to carry large loads. They are spaced closely together to carry smaller loads. Ball bearing wheels, welded to the rail member, are staggered four wheels per foot for normal applications, or paired eight wheels per foot where extra capacity is required.

White lines on chart show conveyors at RCA-Estate. When the flow schedule or job changes, conveyors change, too



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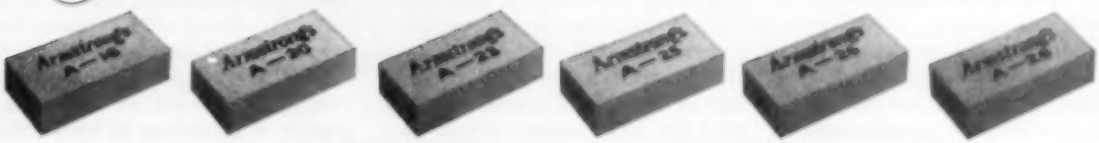
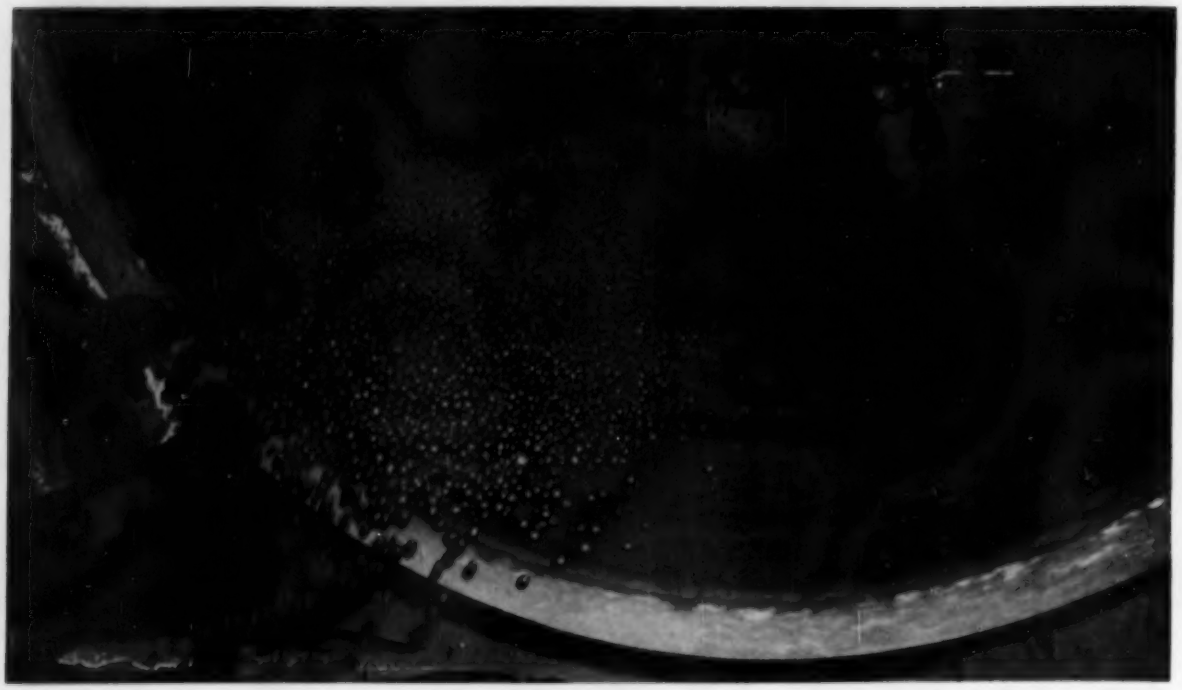
Armstrong INSULATING REFRACTORIES





Operation with 100-per-cent burden is successful, so . . .

Sinter Makes Blast Furnace News

BURDENING the blast furnace with a 100-per-cent, sinter-ore charge was one of the top attention-getting topics at the recent convention of the AIME's Blast Furnace and Open Hearth committees in Philadelphia.

On the open-hearth side, it was the operation report on the all-basic brick furnace that drew the standing-room-only crowds.

Both topics take on added significance in this competitive era. It has been estimated that there is a potential of 20 per cent added to the output of every blast furnace using a sinter charge. With the oxygen process and electric-arc steelmaking becoming stronger competitors, the higher tons-per-hour rate of the all-basic open hearth is most welcome.

100-Per-Cent Sinter — There is a definite increase in iron production, lower coke rate and lower flue-dust production, reports R. W. Sundquist, division superintendent of blast furnaces for U. S. Steel's Gary (Ind.) works. For nine months, the No. 12 furnace operated on 100-per-cent sinter. The tests proved some interesting points:

1. It wasn't necessary to provide a long period of adjustment when changing the burden to reach the 100-per-cent sinter. 2. There was practically no change in the temperature of the iron produced. 3. High blast temperatures were demanded for smooth operation. 4. Lower wind volumes were required. 5. There was a tendency to build up on the walls, requiring periodic cleaning. 6. The thermal load of the furnace was significantly decreased. 7. When higher percentages of sinter are employed, it is extremely important to have close control of the sintering operation.

Some Details—Comparison with No. 8 furnace at Gary (its size and age of lining were almost identical with No. 12's) showed a coke rate of 1328 lb per ton for the No. 12 furnace, against 1655 lb per ton for No. 8. Production of tons of iron per square foot of hearth area also favored the No. 12—2.74 to 2.37. These figures were for the first six months of operation.

A point often overlooked, according to Sundquist, yet one that has considerable monetary value is the saving in limestone. There was a reduction in stone consumption, after considering the increased use of open-hearth slag, of about 270 lb per ton of iron. In this furnace it meant a saving of 175 tons of stone per day.

All-Basic Open Hearth—"It's a first-helper's dream," was the way A. H. Sommer, Keystone Steel & Wire Co.'s vice president and general superintendent, described the all-basic, open-hearth furnace. Now in its second campaign, this 175-ton, boxcar-type installation at Keystone's Peoria, Ill., plant, currently is producing at better than

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Prime advantage of the all-basic construction is, of course, the higher firing rate. Sommer reports a saving of 1 hour in tap-to-tap time, which adds up to 15 man-hours per heat. Over an entire campaign this saving in man-hours will more than pay for the higher costs of the brick, he maintains.

Lots To Learn—Even with the results obtained and the fact that there were no major or unexpected delays in the 503 heats of the first campaign, Sommers pointed out that we still have a lot to learn. The Germans, he estimates, are three to four years ahead of us in all-basic technology.

He added that the competition of oxygen steelmaking and the electric furnace now forces more activity in this direction. "We might even have to change our concept of checker design," he said. In an effort to get better heat-holding properties, we might even consider silicon carbide for the regenerative parts of the furnace, he contends.

Open-Hearth Slag—Use of large quantities of open-hearth slag in the blast furnace is proving well worth the effort that goes into the change in practice. At Duquesne Works, U. S. Steel Corp., E. B. Speer, the assistant general superintendent of steel production, reports that no adverse effect on analyses or quality of finished steel is experienced. While the slag charge of 450 lb per ton of iron produced may not be suitable in all plants, it has offered these advantages at Duquesne Works:

1. It recovers both the metallic scrap as well as the metallics in the oxides that were in the open-hearth slag. 2. Limestone burden is reduced to 825 lb per ton of iron. 3. The manganese loss to the slag now is recirculated, resulting in a substantial reduction in ferromanganese addition.

Induction Heated Ingots

Next week the Progress in Steelmaking feature will describe the advantages of the first commercial application of dual frequency induction heating to rolling mill ingots. This setup broke the production bottleneck at Western Canada Steel's Vancouver, B. C., works.

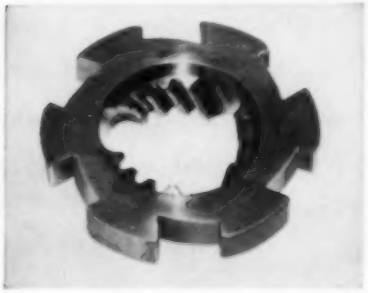
Broaching Spiral Splines

Production setup enables builder to turn out eight broached parts every minute

NINE involute, internal splines and three internal, helical grooves are being cut on a gear plate simultaneously by a manufacturer of transmission parts.

Four plates are broached during one stroke. Production is 480 parts an hour.

Setup—The four-station fixture is equipped with four vertical loading tubes and an automatic shuttling device that receives parts from the tubes and locates them for machining. Broaches are drawn through the parts in a spiraling motion by helical lead bars attached to each broach puller.



GEAR PLATE
. . . with internal spiral grooves

After the shuttle fixture is retracted, completed parts drop onto a hinged baffle that directs them into an unloading chute. Broaches are retracted, and the cycle is repeated. A hydraulic circuit, synchronized with the machine cycle, actuates the shuttle fixture.

Cycling Time—The machine cycle, including loading and unloading, requires 30 seconds. Eight parts are completed every minute, with the broaching machine operating at a cutting speed of 15 fpm.

Colonial Broach Co., Detroit, adapted one of its standard pull-up machines to handle this job.

Metal Cutting

A revised edition of *Metal Cutting Tool Handbook* gives the latest data in this field.

Write Metal Cutting Tool Institute, 405 Lexington Ave., New York, N. Y. Price is $7.50 a copy.

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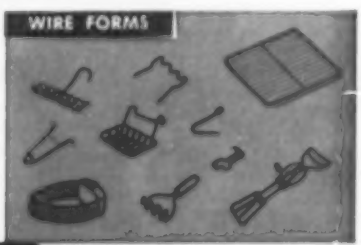

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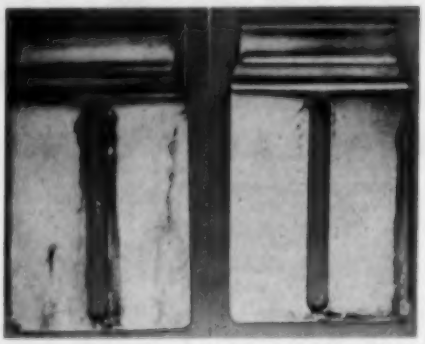
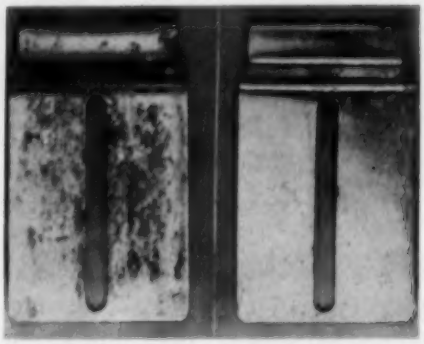
Comparison Test on Chromium Plated Steel Brackets

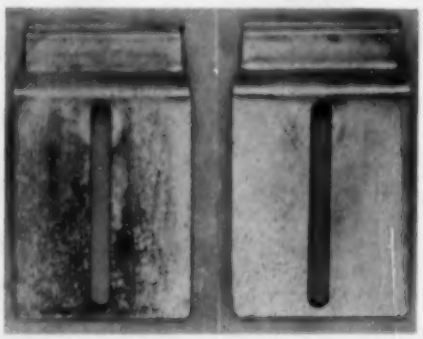
Half-standard plate Standard plate



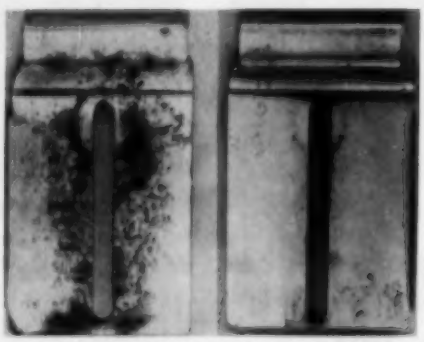
Exposed in 5-per-cent salt spray for 500 hours



Exposed in acetic-acid salt spray for 240 hours



Exposed to industrial atmosphere for four months on roof



Exposed on car license plate bracket for one winter in Detroit

Salt Spray Passes Acid Test

Here's an accelerated laboratory procedure that gives results matching out-of-doors corrosion on plated metal. It's proposed as an ASTM Tentative Method

SAY WHAT YOU WILL about the standard salt spray test, it has not been able to reproduce what happens to a new car after two months on a Detroit parking lot.

An ASTM task force has come up with an answer: Acid.

Chrome Killer — Acid, suggests the task force's report, is the real culprit. Industrial atmospheres are charged with dissolved oxides of sulphur; city snows show a pH down to 3.5 (7 is neutral). Acid, says the report, will do for salt spray what it does for city air.

Recommended is the ASTM, standard, 5-per-cent salt spray (Method B 117) at 95°F, modified to a pH of 3.2 with acetic acid. Used on plated parts, it has given reproducible results that compare favorably with failures on cars in service. Results are so outstanding that the group has recommended

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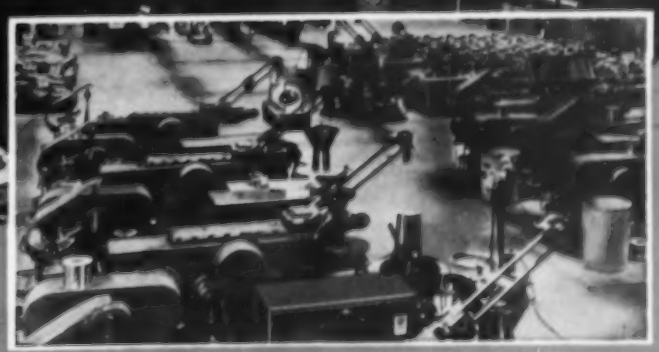

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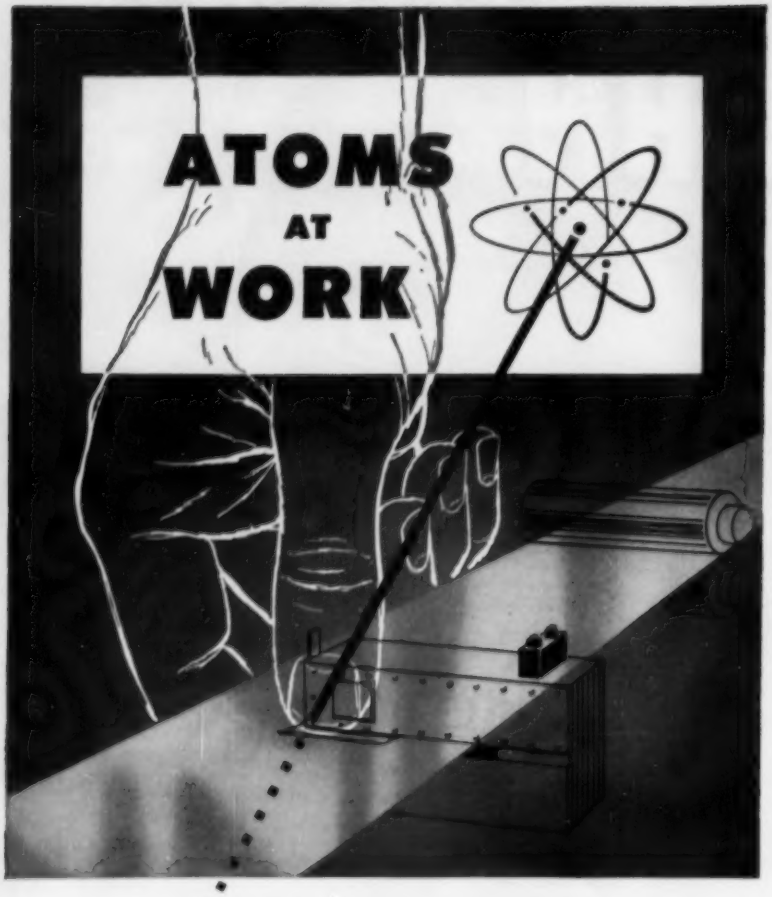

AT **WALLINGFORD STEEL**

At Wallingford, harnessed atoms precisely control steel thickness and assure important improvement in uniformity . . . ***automatically***. Here, radioactive isotopes of strontium or ruthenium demonstrate their superiority over mere man. Electronic continuous gages check strip, ranging down to .002" and to tolerances as close as .0001", without touching the metal to mark or otherwise affect it. ***Man alone is unable to control steel thickness so accurately . . . so fast!***

This practical application of atomic energy to improve our quality control is another reason why you can be confident that Wallingford will meet your most rigid specifications for stainless steel strip and tubing ***exactly*** . . . another reason for arranging to use Wallingford's ultra-modern facilities **soon.**

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STEEL
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WALLINGFORD, CONN., U. S. A.

STAINLESS • ALLOY • HIGH CARBON • LOW CARBON • STRIP AND TUBING

adoption of the test as an ASTM Tentative Method.

At Last — A good many companies that have been using salt spray with tongue in cheek are going to say, "It's about time!" Automotive, paint and allied industries have been using a 5-per-cent test for years, but the government still insists on a 20-per-cent salt solution which promotes nozzle clogging and a fog which is too dry. Neither has proved satisfactory for evaluating copper-nickel-chromium plating systems on steel or on zinc diecastings.

Straight salt spray (Method B 117) shows cadmium superior to zinc in corrosion resistance (right for salt water) but in service on city streets it works just the other way around. That's why the automotive industry dropped cadmium on exposed parts years ago. Acid spray pegs cadmium right.

Blisters—Method B 117 won't reproduce typical service blistering of plated zinc-base diecastings, but the acid modification will. For ten years, the auto industry has been adding 1-per-cent, glacial acetic acid to a 20-per-cent salt solution at 120° F to reproduce blistering. The recommended modification cuts the salt concentration down to a level easier to work with.

The acid spray has been tried on aluminum and aluminum alloys, on aluminum anodized and phosphated and on steel painted, phosphated and covered with rust-inhibiting oils. In many cases, the acid spray revealed chinks in the anticorrosion armor that plain salt failed to touch. The report called the results "quite satisfactory."

Backing—Co-operating with the task force (W. D. McMaster, C. O. Durvin, C. F. Nixon) were General Motors Corp., Chrysler Corp. and Parker Rust Proof Co. Tests were made on chromium-plated brackets which were exposed on a roof and on the front bumpers of cars for one winter. In each case, failures matched acetic acid salt spray results.

It appears that at last there is an accelerated corrosion test about which we can say: The item that fails first in test will fail first in service, or the item that does not fail in x hours of test will not fail in one year of average service exposure.

HOUGHTO-CLEAN
takes the heat off your metal cleaning . . .
BOTH WAYS!

HOUGHTON COLD CLEANERS

- ***keep cleaning room temperature lower***
- ***keep cleaning room morale higher***

Effective in either still tank or power washers, HOUGHTO-CLEAN room temperature metal cleaners provide these new economies for you—welcome benefits for workers:

- Eliminate costly heating equipment and high fuel costs.
- Solution life is long—and easy to mix.
- Higher worker morale—no warm weather dip in production.
- Parts are never too hot to handle.
- Hot, steamy installations are eliminated.

It will pay you to investigate the many advantages of HOUGHTO-CLEAN Cold Cleaners and how they can be applied to your operation. Call the Houghton Man, or write to E. F. Houghton & Co., 303 W. Lehigh Avenue, Philadelphia 33, Pa.

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Ready to give you on-the-job service . . .

Both sides of the crack and the top and bottom of the frame were chamfered 6 in. on either side of crack

Low Heat Welding Saves the Job

A serious crack in a press frame threatened an important order. Without dismantling or preheating, the $80,000 press was repaired for $450

A BREAKDOWN is always a serious matter in plant operations. When it occurs during an important production run, it can prove disastrous.

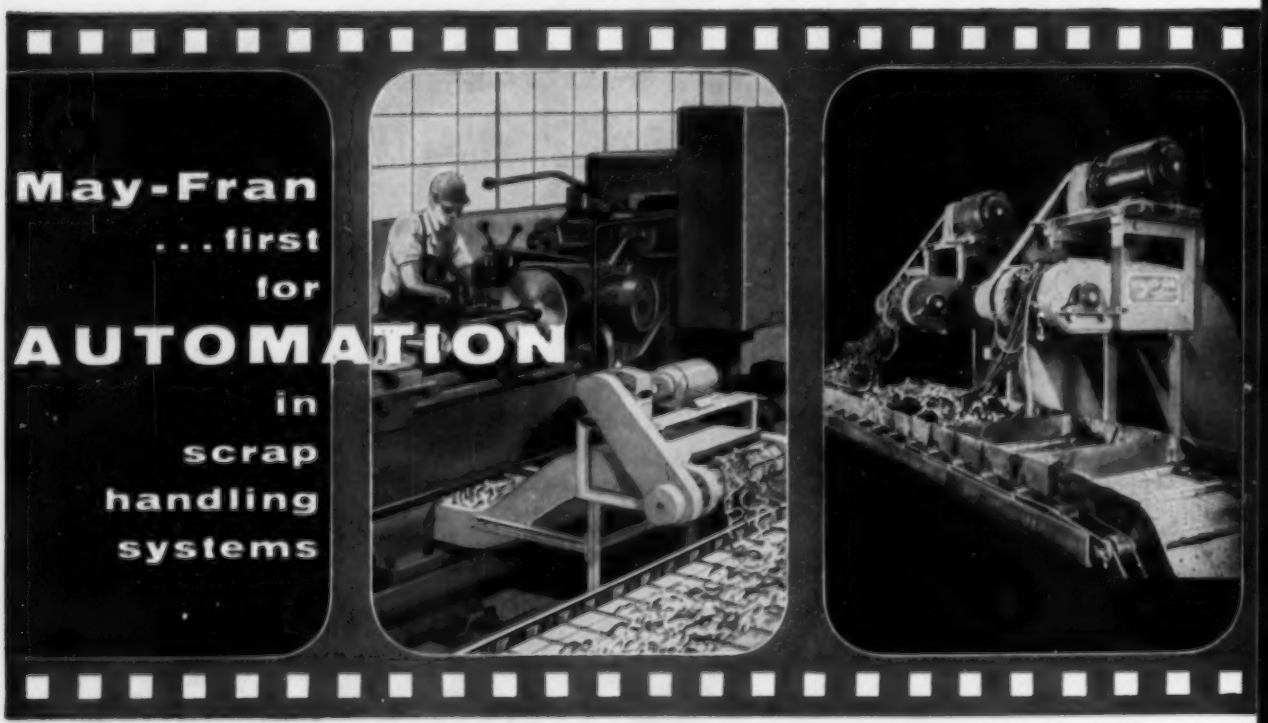
This was the situation at Federal Pacific Electric Co., Newark, N. J., when a 150-ton press failed. Getting it back into production as soon as possible was a must.

The crack was examined and found to be visible on either side of the frame. Company welders agreed the repair was possible if a low heat input process were used—they could weld in position without dismantling or preheating.

Oil Troubles — Because welders could foresee difficulties in obtaining a good bond to the oil-impregnated cast iron, they ran a few passes on the base of the press. It was no good. The filler metal was not surface alloying to the base metal. Bond strength was inadequate.

The difficulty was traced to oil which seeped from the pores of the iron. They had to be sealed, so that nitrogen and hydrogen gas were not formed to cause porosity and pinholes in the weld deposit. A district engineer for the Eutectic Welding Alloys Corp. recommended EutecTrode 27. Trial passes showed it would work.

Preparation—First, all defective



The CHIP-TOTE conveyor permits complete utilization of machine tools by eliminating shut-down for manual scrap removal.

It handles a continuous flow of hot, wet or dry chips, turnings and borings from any multiple spindle automatic machine.

and fatigued metal had to be removed. With ChamferTrode grooving electrodes, metal was removed from both sides of the crack and the top and bottom of the frame.

When veeing was completed, the entire weld area was wire brushed. The heat of the chamfering operation had removed the chill from the casting to improve the flow characteristics of the alloy.

Base Deposit—A 5/32-in. EutecTrode 27 was inserted into the holder and the machine set at 95 amps. This low amperage materially assisted in keeping heat input to the minimum.

The entire area was padded with this electrode to form a foundation for the Xyron 2-24 metal which would finish the weld. Care was taken to avoid depositing metal on the crack.

Finish Weld—First deposits of Xyron 2-24 joined the two sections at the crack. Skip welding was used throughout, and passes (2 in. in length) were continued until the casting was built up.

For additional support, a steel plate was welded to the face of the frame and a smaller one to the top of the casting. When the repair was completed, it was found to be well within the specified tolerances. The machine was in perfect alignment.

Build-up is complete. A small steel plate was later joined to the casting top

The $80,000 press was returned to service with the minimum loss of production. Repair cost less than $450, including labor, chamfering electrodes and welding materials.

Now is the time to put AUTOMATION to work . . . Now is the time to cut production costs . . . May-Fran engineers design and build complete scrap handling systems for the automatic removal of machine turnings or chips. May-Fran conveyors will transmit scrap to ultimate point of disposal.

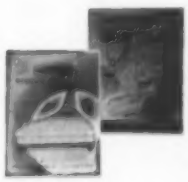
Press Scrap systems can be made completely automatic. Hinged-steel belt will take scrap from presses, handle it through blanking, shearing, forming and baling processes, and deliver it to rail cars.

May-Fran is prepared to engineer, fabricate and install complete conveyor systems to your specifications.

Write today for complete information on how an automatic scrap removal system will cut your production costs.

Bulletin MF-530 describes the new Hinged-Steel conveyor belt.

Bulletin MF-640 describes the Chip-Tote conveyor which removes scrap from operating machines.

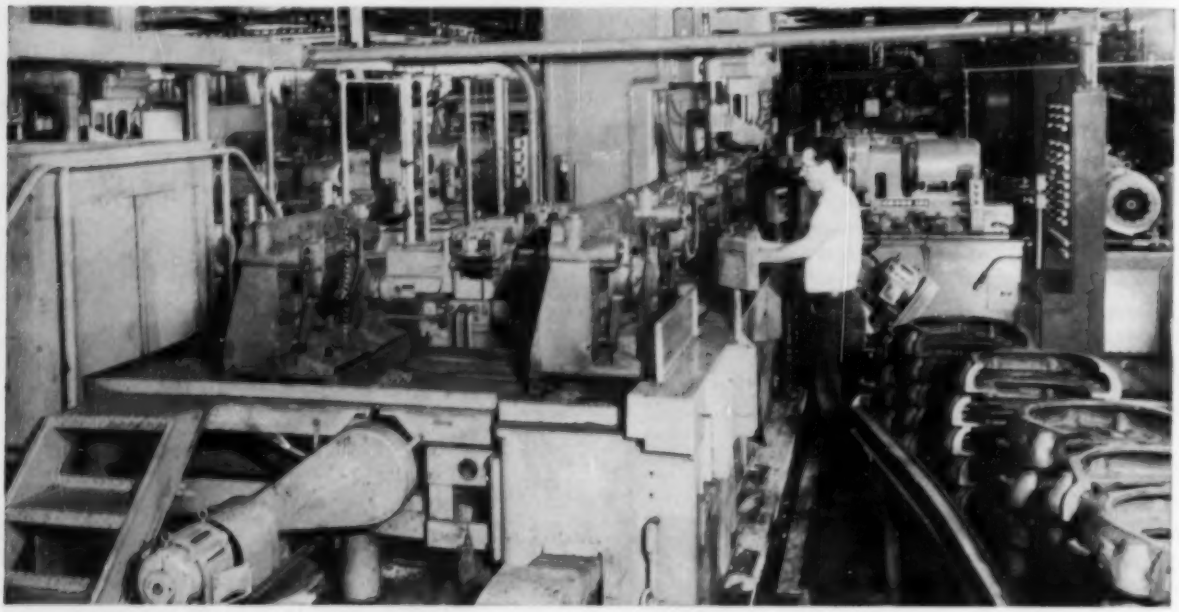


DESIGNERS AND ENGINEERS OF COMPLETE SCRAP HANDLING SYSTEMS

MAY-FRAN ENGINEERING, INC.

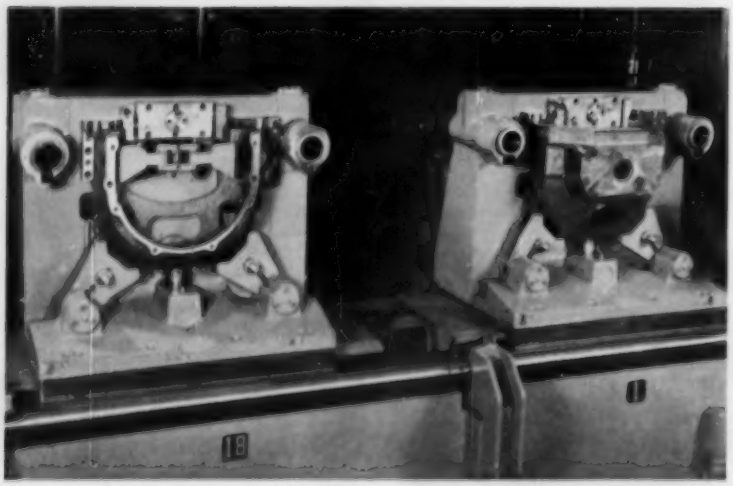
Hinged-steel belting handles scrap as well as hot heavy and abrasive castings. Belt is economical . . . maintenance-free.

1725 CLARKSTONE ROAD
CLEVELAND 14, OHIO



Flywheel housings or clutch housings—they're all the same to this machine. It takes them in any order, senses the difference and performs a different machining job on each

Duplication Licked with Two-in-One Tooling



One face the same on both parts makes it possible to lock them in identical fixtures. Left, Hydra-Matic flywheel housing; right, Synchromesh clutch housing. The machine accepts either or both

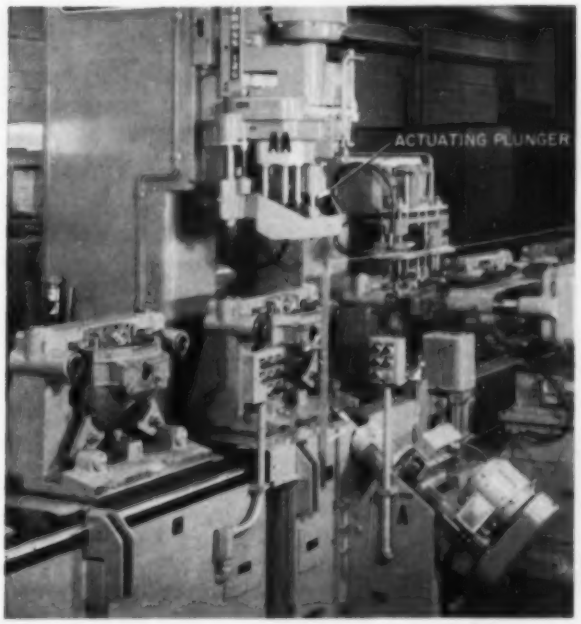
SUPPOSE YOU machine two parts that differ radically but have one common face. The work load varies. One day it's 75 per cent one part; the next it's 75 per cent the other.

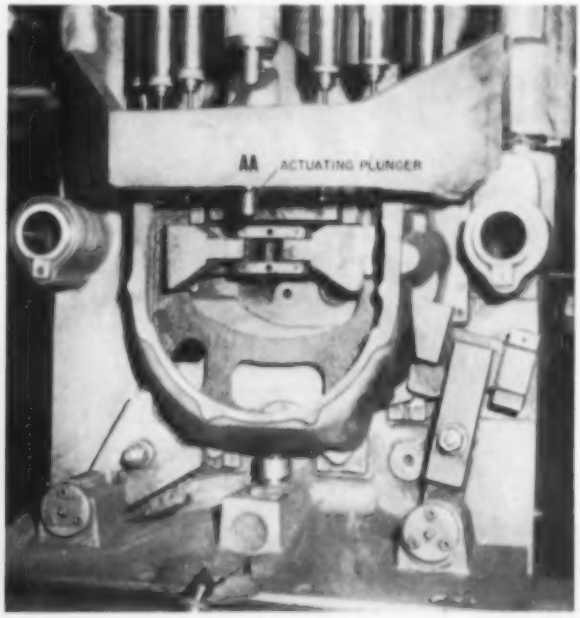
That means two machines which are idle one-third of the time. One transfer-type machine that would accept the parts interchangeably and perform the alternate machining operations automatically would eliminate most of the duplicate tooling. Idle time would be cut to zero.

That's what Pontiac Motor Division of General Motors Corp. thought, and the Cross Co. did.

Either or—You can see the machine at the Pontiac engine plant, Pontiac, Mich., where it turns out mixed Hydra-Matic flywheel housings and Synchromesh clutch housings at a clip of 170 an hour. Each station on this Cross Transfer-Matic performs an alternate function, depending on the part fed to it.

Common denominator of the parts is the face which bolts to the engine block. One set of fix-





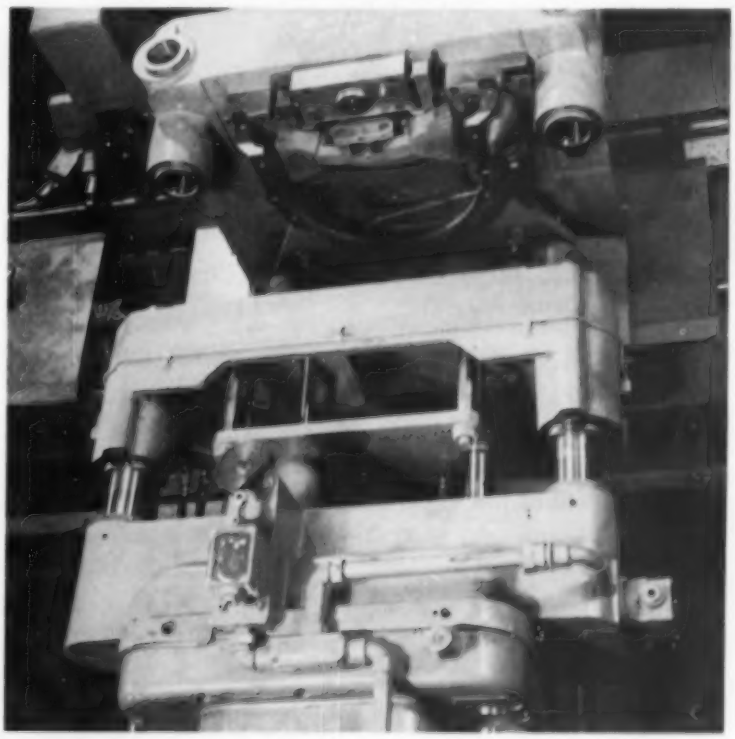
Here's how the machine operates at a typical station (station A-AA). As drillhead AA traverses to meet the part below it, the actuating plunger protrudes. If it contacts nothing, the part is a Hydra-Matic housing and station A remains inoperative. Meanwhile, the two outside drills of the AA head are cutting metal. If the plunger contacts metal, a Synchromesh housing is below it. All AA drills will be cutting metal, and drillhead A will advance from below to drill an angular hole in the housing face. For action at another station, look below

tures can hold either part. The operator simply picks up the part that comes to him on the conveyor, loads it into a fixture and the machine does the rest.

Many Holes — Operations performed are drilling, boring, tapping, countersinking, counterboring, reaming and inspection. Holes on the engine face are the same for both parts, but there the resemblance ends. Actuating plungers at each station tell the difference. They signal the advance or hold back the 212 cutting tools distributed through the 14 stations.

Tool feed and traverse, transfer of parts between stations and locking of parts in fixtures are accomplished hydraulically. A unit for removing chips from the fixtures and a chip conveyor are part of the machine.

Money Talks — Pontiac could have ordered two machines, the conventional way to tool for these parts, but economy was all on the side of two-in-one tooling. With more automatic transmissions and fewer conventional transmissions being made each year, it is easy to see why.



Station HH. The drillhead inspects six holes and reams two others drilled on the Hydra-Matic housing at earlier stations. If a Synchromesh housing moves into the station, the actuating plunger hits it, and the station does not function

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Diecastings Make a Mark

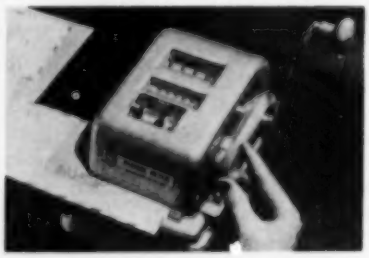
Pitney-Bowes found that postmark dies could be zinc diecast at a much reduced part cost

DIECAST zinc postmark dies are saving Pitney-Bowes Inc., Stamford, Conn., 77 per cent on part costs.

The dies, used on desk-model postage meters, were produced of silicon brass by investment casting (lost-wax method). City and state identification were engraved on the part.

A design study disclosed that satisfactory dimensional accuracy could be achieved in a zinc diecasting at reduced cost.

One Operation—With the new design, city and state information are cast integral with the part. Interchangeable inserts in the die minimize changeover costs when converting from one city identification to another.



DESK-MODEL METER
. . . with zinc, diecast postmark

POSTMARK DIE ASSEMBLY
. . . saves 77 per cent on part cost

The postmark die assembly is shown at the right in the above photo. Containing city and state identification, it slips over the U-shaped bracket, which houses date-stamp wheels and is held in place by two, slip-fit pins. Precision fabrication of component parts simplifies assembly and minimizes alignment problems.

Ready-To-Finish Gears

They save machining time and cost for a manufacturer of locomotive drive gears

FORGED STEEL gear blanks save Pittsburgh Gear Co., Neville, Pa., 1 hour of machining time on each mine locomotive drive gear it produces. Blanks are supplied annealed, rough machined and ready for finishing.

Operators finish turn, face and bore blanks on a Bullard, 36-in., vertical turret lathe. Because the blank already is at standard, machine-shop tolerances, the lathe needs to be set up only once for each gear of a given size.

Hobbing—Gear teeth are hobbed on a Gould & Eberhart, 36-in. hobbing machine. Uniform internal structure of the forging allows the operator to hob at maximum speed. Lack of hard spots and sand porosity has increased the life of high-speed hobs by 20 per cent, says the gear company.

After machining, teeth are flame-hardened to 321-360 Brinell.

HOBBING TEETH
. . . in forged steel gear blank

Tough Job—These spur gears get severe wear in mine locomotives. The heavy trains start and stop almost continuously.

Gear failures put a locomotive out of service. Down time here, like on any production machinery, is expensive. For this reason, most coal mine locomotives are equipped with forged steel gears. Because of their denser core and more uniform internal structure, forgings wear longer.

Ready-for-finishing gear blanks are supplied Pittsburgh Gear by the Standard Steel Works Division of Baldwin-Lima-Hamilton Corp., Burnham, Pa.

NEW
Revised Edition

56-page Catalog of tools *for making:*

WORMS · WORM GEARS · HERRINGBONE · SPUR · STRAIGHT BEVEL
ZEROL · INTERNAL · SPIRAL BEVEL · RACKS · ACME SCREWS
SPROCKETS · SPLINES · KEYWAYS

This FREE Book will cut your gear costs!

When we first offered the BRAD FOOTE Hob List about a year ago the response was tremendous. Thousands of gear designers and engineers recognized in this catalog an opportunity to substantially cut their gear costs. And now, a new revised issue makes possible even greater savings.

The reasons are obvious. Since 1923, BRAD FOOTE has specialized in custom-built as well as production gears. Over the years we have built up a tremendous stock of hobs, cutters and broaches, used in thousands of gear cutting jobs—a stock that enables us to do just about any gear cutting job you may have.

By laying out gears so that they can be made from tools now in the BRAD FOOTE stock, you can save substantially on tooling costs . . . and eliminate delays necessary for the preparation of tools.

The Revised BRAD FOOTE Hob List includes all tools prepared through April, 1955. If you have a copy of the Hob List, write for the revised edition. And if you haven't had a Hob List, write for your free copy—find out how it can save you time and money on gears.

IMPORTANT NOTE:
If you now make your own gears, ask for a copy anyway. You may find that it is cheaper for us to make them.

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NEW PRODUCTS and equipment

Write directly to the company for more information

Thread Rolling Machine

A new feeding system gives Model A-190-R a 75 per cent increase in efficiency.

Essentially Hartford's Model A-190-H, automatic thread roller, the new model has a self-contained rotary hopper. Production is 230 to 250 pieces a minute.

The hopper is designed for easy maintenance and repair. It is independently driven by a 1/12-hp motor, permitting variable bucket speed with a gear change. The cast iron hopper bucket lifts out for servicing without disturbing previous settings. For easy inspection and replacement, the clearing wheel is mounted on a bracket which swings away from the tracks.

Capacities: From machine screw sizes No. 2 (0.086 in.) to No. 10 (0.190 in.); thread length, ⅛ to 1½-in. with standard-depth dies, 2 in. with special-depth dies. Hartford Special Machinery Co., 287 Homestead Ave., Hartford 12, Conn. Jackson 5-1401

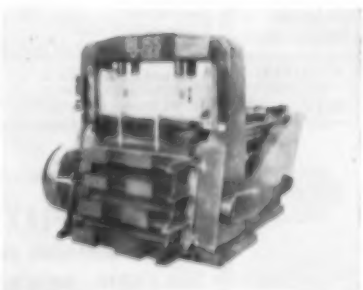
100-Ton Automatic Press

This double-crank press is built with 40, 50 and 60 in. between uprights and is 32 in. front to back. Speeds range from 80 to 240 strokes per minute. It features the cylindrical-type ram for accurate alignment. Air-clamped feeds prevent stock distortion and permit positive feeding. It is available with single or double feeds and a scrap cutter.

Standard equipment on the press includes a balanced crankshaft, air counterbalances, an automatic-metered lubrication system, wired electrical control system, air clutch and special shock mounts.

This welded steel press is particularly suited for industries requiring the stacking of parts. The leg design permits large accessible areas under the press for the installation of stacking devices. The leg design also raises the bed height for easier setup. Di Machine Corp., 2701 W. Irving Park Rd., Chicago 18, Ill. Independence 3-3101

High-Speed Scroll Shear



It is designed for the high-speed blanking of scroll strips for can ends, bottle caps and jar tops. The wide bed handles sheets up to 36 in. square.

Built for precision feeding and trimming at high speeds, the No. 1100 can be automatic or hand fed. It is equipped with magnetic or mechanical feed bars and a new intake trimming slitter. For extra rigidity, the one-piece frame is of cast Meehanite. The slide, equipped with long guides, is counterbalanced.

There is ample room for new dies, which can be mounted easily in the die sets with guide pins (double and triple dies can be used). Other features include bronze-bushed connections at both ends, antifriction bearings for slittershafts, electric pushbutton controls and air-actuated, friction clutches. E. W. Bliss Co., 1375 Raff, SW, Canton, O. Canton 7-3421

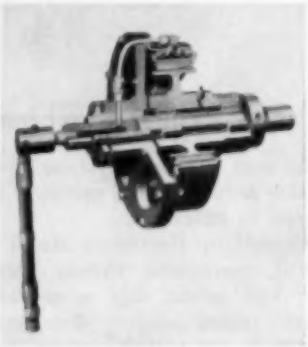
NEW PRODUCTS and equipment

Small Clutch Applications

Furnished in complete, low-cost, packaged units, these clutches are designed for machines with power requirements of 1 to 31 hp. Ease of adaptability (through standardization of bores and mountings) and tapered bushings, result in reduced installation and service costs.

Features: 360-degree engagement, uniform friction pressure, instant response to electropneumatic controls, automatic compensation for wear to friction shoes and complete disengagement. The clutches are adaptable to cyclic or continuous operations and can be locally or remotely controlled.

Mounted with tapered bushings, the spider bearing (illustrated) has an extended drum hub mounted on antifriction bearings. A mating sheave or sprocket can be adapted



to the extended portion of the drum hub. A spider, gap-mounted type (with tapered bushings) makes possible simplified installation direct to a mating component. A spider, close-mounted bearing with tapered bushings is designed for flexible coupling service. All applications provide overload protection. Fawick Airflex Div., Fawick Corp., 9919 Clinton Rd., Cleveland 11, O. Atlantic 1-2211

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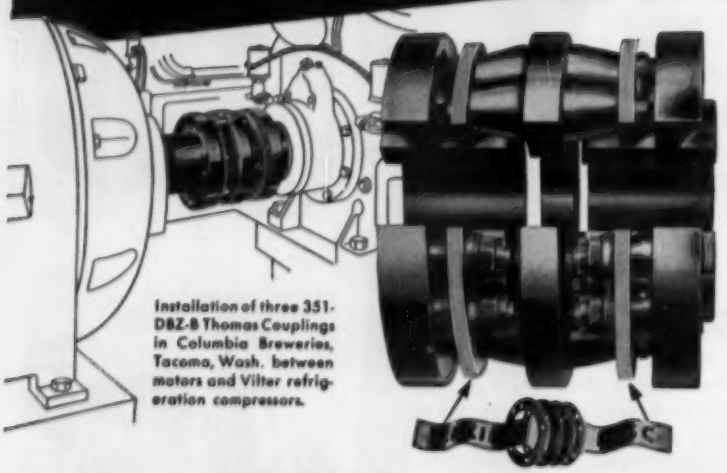
for more years of better service!



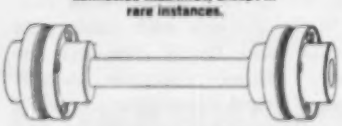
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.

Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



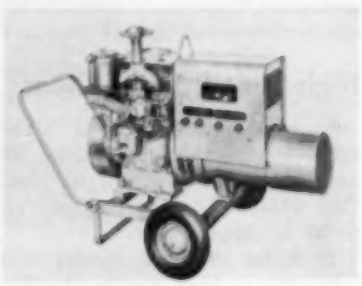
THOMAS

Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

Engine-Driven Arc Welder

This lightweight, heavy-duty machine welds, cuts, solders, brazes or hard surfaces. Weighing 425 lb, the WN-180 has a service range of 20 to 200 amp to take



care of practically any welding job. Its outside dimensions, 45 x 29 x 21 in., make it ideal for jeep or small truck mounting. (A detachable, two-wheel mounting is available).

The unit is powered by an in-

dustrial-type, 12-hp, 2-cylinder, 2000-rpm, Wisconsin, air-cooled engine. (The latter prevents freezing.)

The operator merely plugs in to the range he desires—high, low or medium—and starts welding. Harnischfeger Corp., Welding Div., Milwaukee 46, Wis. Orchard 1-4400

Flange-Mounted Bearings

Here are low-cost, self-aligning bearings designed for machine frame applications. A labyrinth composition seal assures retention of lubricant and the exclusion of foreign material. Shaft sizes range from ½ to 1¼-in. Applications: They are recommended for medium loads, and speeds ranging up to about 5000 rpm max.

The F100 assembly is mounted

in a frame opening and is attached by three bolts which are tightened after the shaft is inserted and aligned. Tightening the three holding bolts clamps the bearing in a fixed position. Two setscrews are locked in the final operation. Nice Ball Bearing Co., 30 & Hunting Park Ave., Philadelphia, Pa. Baldwin 3-6000

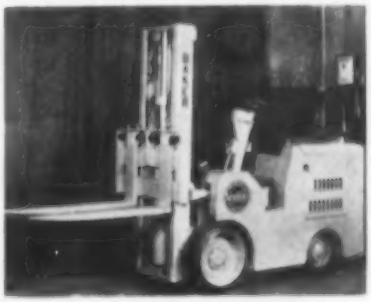
Gas-Electric Truck

This 3000-lb unit, model FD-30, utilizes a variable-voltage generator with a gasoline engine, to give the performance of a gas-engine truck with the economy of an electric truck. Clutch, transmission and gear shifting are eliminated.

A foot-pedal-operated, electric-inching control, permits high-speed hoisting at low travel speeds.

The unit is powered by a heavy duty, 4-cylinder industrial engine. A low-pressure hydraulic system, with a continuous-flow pump supplies oil to lifting and tilting cylinders. Speed is controlled by a metering valve which by-passes excess oil to the reservoir.

Maximum travel speed with full load is 8 mph. Full-load lifting



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Save TIME and DOLLARS for AMERICAN INDUSTRY
For example: KELITE PROCESS 235 is a remarkable dry powder which is used in water solution . . . safely removes hard water scale and certain heat formed scale, rust and paint, from ferrous metals no acid pickling, no electrolytic current, no involved processing, no expensive equipment required just minutes!
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Ridgely & Bush Sts., Baltimore 30, Md.

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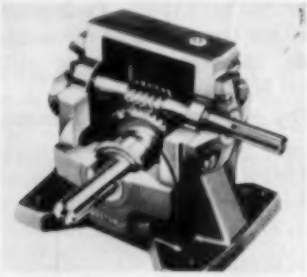
speed is 40 fpm. Total lift height is 130 in. The power axle has a single-reduction, worm-gear drive. Baker-Raulang Co., 1250 W. 80th St., Cleveland, O. Olympic 1-3000

Speed Reduction Units

The 100-series reductors are standard gear reduction units made in a full range of models and ratings for all drive needs. Compact design and improved worm gearing provide greater load carrying capacity, with less weight and space. Fins on housings improve heat dissipation. Fan cooling



is optional on larger-sized reductors, except compound units.

Units are available in 52 standard stock models—283 units with ratios from 5:1 to 3600:1, and output torque ratings from 40-in. lb to 9400-in. lb. Boston Gear Works, 73 Hayward St., Quincy 71, Mass. President 3-0400

Transducer Converts Variables to Air Output

Electrical measurement of such process variables as temperature, speed, power and pH are converted into a proportional 3-15 psi pneumatic output and transmitted to graphic panel receivers by this emf pneumatic transmitter.

Easily mounted on the back of a control panel, the transmitter receives a millivolt signal from the measuring element, converts it into a proportional 2000-cps, a-c voltage, amplifies and filters the signal and feeds it to a phase detector circuit. The resulting direct-current output is passed through a temperature-stable resistor and a transducer winding, which are con-

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Distinctive Styling provides an attractive, modern appearance matching the control center design.

Easier Installation because removable front and back plates expose generous wiring parts. Isolated horizontal wiring trough has drop-off openings, assuring safer, neater wiring.

Flexibility. Complete sections or branch units can be added or changed to meet specific job requirements.

Easier Inspection and Maintenance. Front, side and back plates are removable, thus providing easy and immediate access to specific areas.

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Write for Bulletin SD-18. Address Square D Company, 6060 Rivard Street, Detroit 11, Michigan.

Write for Bulletin 244. Address Square D Company, 4041 N. Richards St., Milwaukee 12, Wisconsin.

SQUARE D's **NEW** PLUG-IN

CONTROL CENTERS

DESIGN LEADERSHIP FEATURES

Increased Safety because bus bars are fully enclosed, rigidly supported and have ample cross section...circuits isolated by individually enclosed plug-in units...disconnect handle designed for maximum operator protection.

Flexibility. Individual plug-in units or complete sections can easily be added, removed or exchanged. Push-buttons, pilot lights, and selector switches can readily be added to unit doors.

Installation Economy. All wiring channels are large and accessible from front without removing units...no "wire fishing."

Space economy, too. Up to six combination starters fit in a 20"x20"x 90" section. Plug-in unit heights are designed in space-saving increments of 3 inches.

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A protective, attractive openwork of steel bars and links—admits light, air and vision
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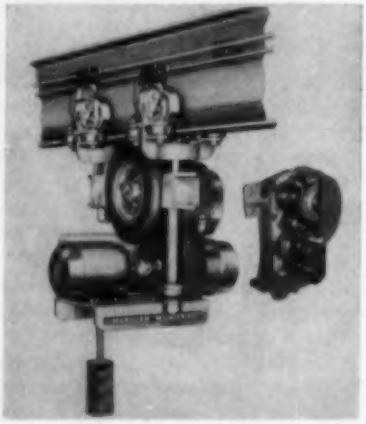
nected in series. Current through the resistor provides inverse feedback equal to 99.8 per cent of the input signal. Current through the transducer winding provides a magnetic force that positions a flap-

per-nozzle assembly in the transducer to produce an air relay output proportional to the original direct-current measurement. The output is transmitted to an indicator, recorder or controller. Foxboro Co., Foxboro, Mass. Foxboro 311

Monorail Drive Unit

This precision-built drive unit allows a hoist or other type carrier to be propelled on monorail track. Traction is obtained by spring-loaded contact of the rubber wheel



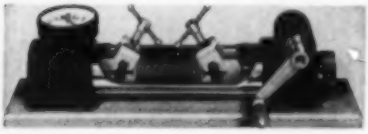
against the bottom of any smooth flange track. Duti-rated, life-time helical gearing is used. Speed range from 35 to 350 fpm; power, from ¼

to 2 hp. Any standard NEMA frame motor and any type motor brake can be used. There is automatic adjustment for tire wear. The motor drive unit is available with fluid drive for cushioned start.

This new unit can meet any type automatic or power-propelled load transfer on a monorail system. It meets all requirements for constant service, exact delivery cycles, grade travel or the movement of loads up to 5 tons with power consumption and maintenance held to a minimum. American MonoRail Co., 13107 Athens Ave., Cleveland 7, O. Lakewood 1-6000

Portable Tensile Testing Machine

The tester may be used to test strip steel, wire, bolts, screws, spot welds or anything within its 4000-lb capacity. A release knob allows the specimen jaw to be adjusted quickly. A moderate pull on the crank is sufficient to apply the



maximum load. Results are read from the load gage on top.

The base of the tester measures 7 x 15 in. The shop device should prove useful to demonstrate tensile strength on sales calls and at trade shows. Detroit Testing Machine Co., 9390 Grinnell Ave., Detroit 13, Mich. Walnut 1-0659

Hot Spray Cuts Production Line Rejects

Uniform viscosity and controlled temperature application provided by the Circaflo 300, hot-spray heater eliminates paint department bottlenecks. Standard industrial finishes give better coverage and have greater life.

The unit combines the advantages of a coilless heat exchanger and the Circaflo pump. (This pump has no bearings or close fitting tolerances to wear and is

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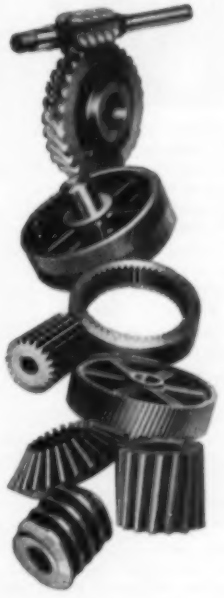

You can get practically every kind and every size gear you need from Horsburgh & Scott. Expert engineering, skilled craftsmanship and top quality materials assure you of the best possible gears for every job.

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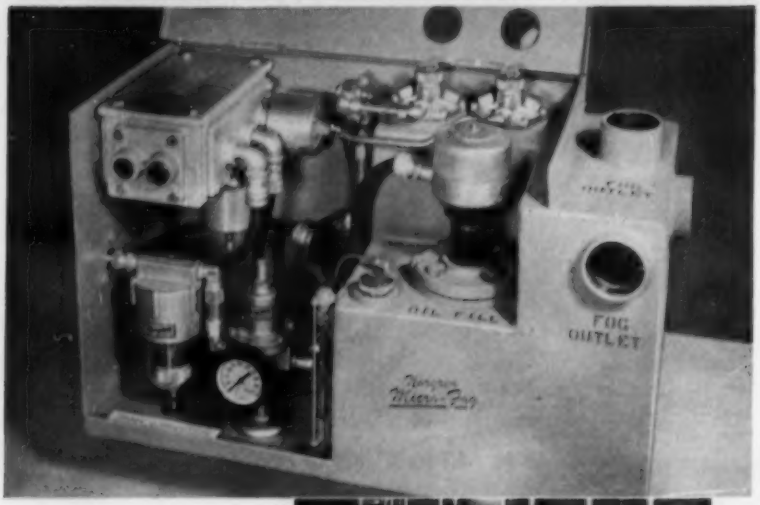
an easy, effective way to reduce lubrication and maintenance costs and increase output

NORGREN MICRO-FOG 33AB LUBRO-CONTROL UNIT



Model 33AB-4 lubricates 350 bearings and 170 spur gears on large Cross Transfer-Matic using only 1.6 fl. oz. of oil per hour and 10 cfm. of air.

1. Produces a high concentration of oil fog—provides maximum transmission with minimum air consumption.
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3. Produces a fine fog that is uniformly distributed to multiple outlets, assures thorough, dependable lubrication at every bearing surface.
4. Reduces cost of installation and maintenance of bearing and gear box seals.
5. Eliminates the need for many smaller lubricators and complex piping systems.
6. Pressure switches and liquid level controls automatically actuate alarm system or stop machine a) when oil supply reaches a pre-selected low level, b) when air pressure fails, c) when excessive pressure develops in oil supply tank.
7. Solenoid valve starts and stops the Micro-Fog Lubrication system as the machine is turned on and off.
8. Maximum flexibility in control of Micro-Fog: two high capacity lubricator heads may be used simultaneously or individually, depending on fog requirements; oil feed regulated by applied pressure over a wide pressure range.
9. Three 2" Micro-Fog outlets may be used separately or in combination to facilitate connecting and routing of distribution piping. Air inlet is ½" pipe size.
10. Rate of oil feed visible through sight feed dome on each lubricator head.
11. Oil gauge on tank visually indicates oil level.
12. Automatic-Drain Filter removes moisture and solids from air line, drains collected moisture automatically, prevents contamination of oil supply.
13. 1" conduit connection serves centrally located water-tight junction box.

For engineering information on the application of Micro-Fog Lubrication, write for Norgren Blueprint MF10. Or ask for our engineering service to help you on your specific applications.

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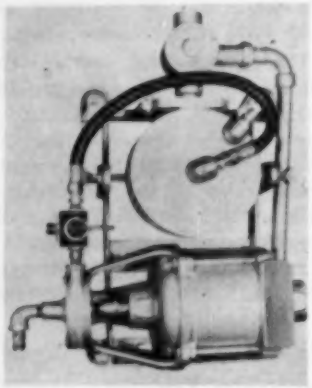
equipped with a high-powered, ¼-hp, explosionproof, electric motor.)

One coat is equal to two con-



ventional coats. Application is faster and sagproof. Spee-Flo Corp., 720 Polk Ave., Dept. C 12, Houston 12, Tex. Blackstone 0461

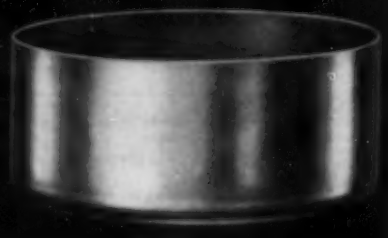
Manual Motor Starter for Across-the-line Starting

The starter also provides overload protection for fractional horsepower motors driving small machine tools, woodworking equipment, fans, blowers and similar machines. Operation is by an "on" and "off" standard-type toggle lever. The toggle mechanism is

positive acting, producing quick-make and quick-break contacts. The snap action, twin-break silver contacts reduce arcing and provide increased contact life. The starter has straight-through wiring with line terminals at the top and load terminals at the bottom. A eutectic alloy thermal overload relay

Joe Vuille says it's simple arithmetic:
"180 cups per min. x 60 min. x 40 hours per week x 5 weeks=

2,160,000 brass cups in one uninterrupted run"



From the cup illustrated actual size above, socket shells are produced in eight operations on special equipment, followed by a stress-relief anneal and a final bright-dip.

Socket shell caps like this are formed in an 8-operation multiple-plunger press at the rate of 86 per minute.

Typical of Leviton's complete line of lampholders is this "Electrolier Push Thru" model. Both shell and cap are made of ANACONDA Brass.

For more than 20 years, Joe has been pressroom foreman of Leviton Manufacturing Company, Brooklyn, N. Y., one of the world's largest manufacturers of electrical wiring devices.

Multi-million production runs of stamped and drawn products are nothing new to Joe, but he'll admit that there's more to it than a multiplication table:

"First," says Joe, "you start with a good product design. Then the toolroom calls on its broad experience in diemaking. Next, good equipment and good housekeeping are essential in the pressroom. And then there's the brass: these extra-large coils of brass strip have to be just so . . . in dimension, composition, grain size, temper and surface finish . . . lot after lot after lot . . . tailor-made for the job."

Each year Leviton uses many thousands of pounds of ANACONDA Brass, produced to Leviton's precise specifications, "just so . . . lot after lot after lot . . . tailor-made for the job." Perhaps we can perform a similar service for you? Write to *The American Brass Company, General Offices, Waterbury 20, Connecticut.* In Canada: *Anaconda American Brass Ltd., New Toronto, Ontario.*

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Reinforcing Rod Plant UPS PRODUCTION 300%

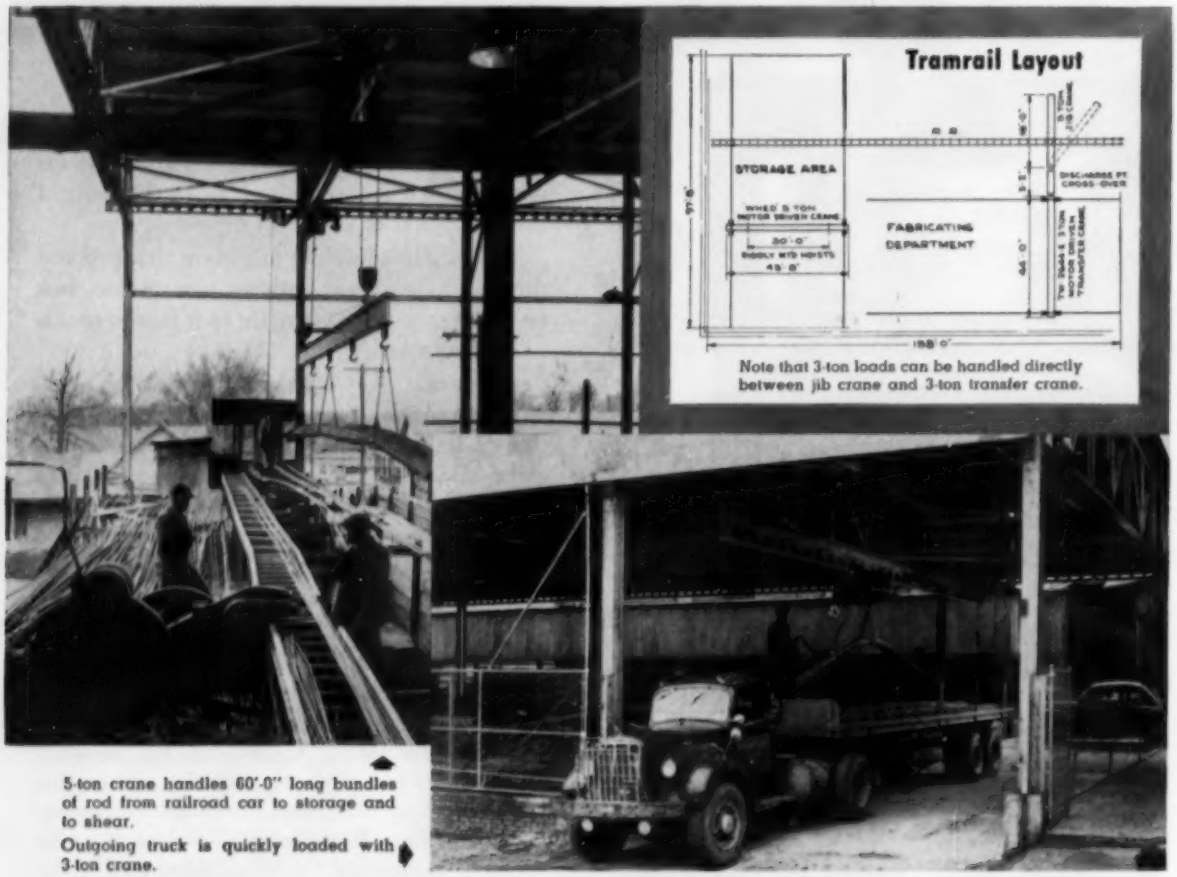
Cleveland Tramrail System Pays For Itself In 6 Months

AFTER a reinforcing rod plant built a new building and equipped it with Cleveland Tramrail cranes, manufacturing costs took such a nose dive that they would make any cost-conscious plant manager blink with amazement.

Whereas eight men were required to work 8 hours to unload a 50-ton car of rods in the old building, two men using Tramrail cranes now do the job in 30 minutes. The Tramrail equipment has enabled doubling the production, and at the same time reducing man-hours by one-half. In other words, the production per man-hour is four times what it formerly was.

The savings have been so phenomenal that the entire Tramrail system was paid for in the first six months of operation.

Nearly every industry is securing important advantages with Cleveland Tramrail equipment. A nearby Tramrail sales engineer will gladly suggest ways that savings can be made in your plant.



Note that 3-ton loads can be handled directly between jib crane and 3-ton transfer crane.

5-ton crane handles 60'-0" long bundles of rod from railroad car to storage and to shear.

Outgoing truck is quickly loaded with 3-ton crane.

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OVERHEAD MATERIALS HANDLING EQUIPMENT

with inverse time limit features is offered in both double and single poles, open and enclosed types.

The case and cover are bonderized for lifetime rust resistance. Knockouts for ½-in. conduits are included in both top and bottom. The open type has the starter mechanism in a molded phenolic shell. Wires can be run around it. The enclosed starter is recommended for general applications where other enclosures are not provided. The open type is suited for machine cavity mounting, back of plate mounting and wall mounting in a standard (Handy or Gem) outlet box. Cutler-Hammer Inc., 320 N. 12th St., Milwaukee, Wis. Broadway 1-7800

De-reeling Device Pays Off Soft, Nonferrous Material

It can be attached to the top of a 20-in.-diameter drum (500-lb capacity) or to a conventional 5-gal pail (100 lb-capacity) loaded with wire in one continuous strand. Conical in shape, the devices are provided with adjustable tension sheaves which permit the de-reeling of fine or heavy wire from the

containers at high or low speeds.

This method makes it possible for wire users to wind such items as motor coils at approximately twice the speeds of present operations. There is freedom from tangle. Coulter & McKenzie Machine Co., Bridgeport, Conn. Edison 5-1101

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NEW literature

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Nickel-Copper Alloy Steels

This catalog covers applications of high-strength, low-alloy steels in transportation, bridge construction, mining, agriculture, marine equipment and other fields—48 pages. International Nickel Co. Inc., 67 Wall St., New York 5, N. Y.

Colloidal Graphite

Electric-furnace graphite of high purity, when processed to colloidal size and dispersed in a suitable carrier, is an effective surface coating for many mechanical devices. "Colloidal Graphite for Surface Coatings and Impregnation" lists ways the product is used with a variety of materials, including porous minerals, cloth, felt, leather, asbestos and paper —bulletin 435, 6 pages. Acheson Colloids Co., division, Acheson Industries Inc., Port Huron, Mich.

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Material Handling

This bulletin includes illustrations of modern industrial trucks with the latest material-handling attachments. Discussed are: The unit-load principle, power requirements of industrial trucks and characteristics of Edison nickel-iron-alkaline storage batteries —32 pages. Thomas A. Edison Inc., Edison Storage Battery Div., West Orange, N. J.

Drop Forgings

This brochure shows how designers can utilize closed-impression drop forgings for intricately shaped parts as large as 10,000 lb. Increased latitude in the design of large parts is made possible with Ladish's powerful forging hammer—Ladish Co., Dept. FR, Cudahy, Wis.

Ground Thread Taps

Revised standards are explained. The changes meet requirements of industry and the federal services. Tables detail new limits, the relationship between the old and new and their application to a specific size and class of thread tolerance—bulletin No. T-583, 25 pages. Pratt & Whitney, division, Niles-Bement-Pond Co., West Hartford 1, Conn.

Battery Line

Here are the specifications on the PlastiCell battery. Data on ratings and capacities, details of design and construction, dimensions, weights and types of containers are included—bulletin T-527/55, 4 pages. C & D Batteries Inc., Conshohocken, Pa.

Tools and Blanks

This manual aids users of Carmet cemented carbides in the selection, fabrication and application of tools and blanks. Descriptions of grades, instructions and drawings covering all operations and tool types are included—19 pages. Allegheny Ludlum Steel Corp., Carmet Div., Detroit 20, Mich.

Hob List

Brad Foote Gear shows how its hobs, cutters and broaches can do almost any gear cutting job without additional tools—56 pages. Brad Foote Gear Works Inc., 1309 S. Cicero, Cicero 50, Ill.

Magnesium

"The Magnesium Industry's Broadest Scope of Services in Fabricating, Assembling and Finishing" shows this company's facilities for working titanium and magnesium. Commercial products are shown, and relative

NEW LITERATURE

weights of common metals are given —8 pages. Brooks & Perkins Inc., 1950 W. Fort St., Detroit 16, Mich.

Forging Hammer Catalog

Nazel hammers for every requirement are displayed. Specifications, installations and applications are included—20 pages. Lobdell United Div., United Engineering & Foundry Co., Wilmington 99, Del.

Leasing Trucks

Here are the pros and cons of industrial truck leasing. Working capital, tax considerations, leasing vs. borrowing capital are among the subjects covered—4 pages. Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, O.

Rod and Wire Products

Here are weight tables, specifications and other technical data on several materials—Titan, free-cutting brass, commercial bronze, Ti-nic-o-sil, Tombasil, forging rods and shapes, brass wire and Tru Shaft boat shafting. "For Your Metal Money's Worth" illustrates the products described—20 pages. Titan Metal Mfg. Co., Customer Service Div., Bellefonte, Pa.

Wet Blasting

"A New Source of Profits for Heat Treat Shops" tells how to remove scale from precision work. Pictures show nine parts cleaned in Liquamatte machines. Performance data are given for each—bulletin No. 123, 4 pages. American Wheelabrator & Equipment Corp., 1157 S. Byrkit St., Mishawaka, Ind.

Welding Stainless

Presented for the most part in question-and-answer form, "The Welding of Stainless Steels" describes types and properties of steels, practical welding procedures and types of electrodes available—48 pages. McKay Co., 330 McKay Bldg., 1005 Liberty Ave., Pittsburgh 22, Pa.

Carbide Prices, Specs

This book features "Throw-Away" insert blanks, each size in two thicknesses. It covers standard tools and blanks—16 pages. Adamas Carbide Corp., Kenilworth, N. J.

Extruded Parts

Special headed and threaded parts are produced economically in quantity by single or double extrusion, says "Specials . . . by Specialists." Examples of parts are illustrated and various methods of procedure explained—4 pages. Cleveland Cap Screw Co., 2917 E. 79th St., Cleveland 4, O.

Electric Conductor Accessories

Know how to select and install accessories that go with aluminum wires and cables in overhead electric transmission and distribution lines? This guide has chapters on joints, dead ends, suspension clamps and tie wire, connectors, armor rods and vibration dampers—12 pages. Reynolds Metals Co., Division PR, 2500 S. Third St., Louisville 1, Ky.

Heat Treating Steel

"The Homocarb Method with Microcarb Atmosphere Control for Heat Treatment of Steel" describes this equipment's performance. Operations include case carburizing, carbon restoration, homogeneous carburizing and the hardening of steel products on a reproducible, mass-production basis—catalog TD4-620(1), 20 pages. Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.

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In brief—a quality product which will do everything required of socket head screws—and more. For all counterbore applications.

Wherever the Ferry Cap Countr-Bor Screw has been tried, users are enthusiastic—saying that these screws are a service man's dream and the best development in socket screws in recent years. They will help you lick tough assembly problems where socket screws are required.

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STEEL

May 9, 1955

Market Outlook

THE strong upward swing in steel production carried tonnage output to a new high—2,328,800 net tons of steel for ingots and castings in the week ended May 8. Previous weekly record was 2,324,000 tons in the week ended Mar. 29, 1953.

The new weekly record for tonnage was established without a record in percentage of operations. Rate in the week ended May 8 was 96.5 per cent of capacity. There were times when operations exceeded 100 per cent of capacity. Today's record capacity makes it possible to set new tonnage records when operations are below that figure.

FEAST OR FAMINE—Record steel output in peacetime is giving rise to talk of further expansion in capacity. Present capacity might suffice for several years if the steel industry were not susceptible to wide swings in demand. Steel ingot production is 38 per cent above what it was a year ago. Industry as a whole has not gone up that much. STEEL's industrial production index is up only 25 per cent. The Federal Reserve Board's latest industrial production index (March) is up only 10 per cent over March, 1954.

BELOW THE AVERAGE— When production was going down a year ago, steel ingot output was off 25 per cent, compared with the comparable time of 1953, yet STEEL's industrial production index was down only 14 per cent; the FRB index, down 9 per cent.

ACCELERATED BY AUTOS— Contributing substantially to the strong upward swing in the steel industry is automobile production. It, too, is setting new high records. Currently, auto output is 47 per cent above that of a year ago. The auto industry is not only the largest user of steel, but it is taking an increased percentage of it. Ordinarily, it gets about 20 per cent of the steel. Now it is taking around 25 per cent. This means the auto industry is buying 25 per cent more steel than it usually does—one good reason why steel output is so high. Another good reason is high activity in construction.

FOUNTAINS OF OPTIMISM—The high rates of operations in the steel, auto and construction industries have spread optimism and confidence throughout the economy, and generated demand from other industries for steel.

PRODUCT ROUNDUP—Demand for cold-rolled carbon steel sheets, silicon sheets, galvanized sheets, enameling sheets and other coated sheets continues to be strong, and bookings extend to September. Order backlog of stainless sheets is growing. Plate order books have tightened further, and most producers are booked through July. Little structural tonnage, particularly wide flange, is available before August. Bar buying is accelerating, and July order books are nearly filled. Orders for wire are improving, but they still are geared close to consumption. Line pipe is in strong demand, but some of the smaller forms, like merchant pipe, are in easier supply than some other products.

HINT OF THE FUTURE—Prices in the scrap market hint a decline is in store for steel production. For the third consecutive week, STEEL's price composite on steelmaking grades of scrap went down. Latest price is $35.33 a gross ton, compared with $36 for the preceding week.

NATIONAL STEELWORKS OPERATIONS

DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended May 8	Change	Same Week 1954	Same Week 1953
Pittsburgh	99	+ 1*	67.5	93
Chicago	99	— 2*	79.5	106.5
Mid-Atlantic	96.5	0	56	97.5
Youngstown	98	+ 2	68	106
Wheeling	95.5	0	83.5	101
Cleveland	100.5	+ 2.5*	76	101.5
Buffalo	104.5	0	67.5	106.5
Birmingham	93.5	0	56.5	102
New England	88	— 2	55	92
Cincinnati	93.5	+ 1	61.5	97.5
St. Louis	106.5	+ 6.5	72.5	92
Detroit	91.5	— 0.5	63	108
Western	98	+ 6*	72	109
National Rate	96.5	+ 0.5	67	100

INGOT PRODUCTION‡

	Week Ended May 8	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	144.9†	143.6	143.2	103.0
NET TONS (In thousands)	2,328†	2,307	2,309	1,654

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 39 Technical Outlook—p. 77

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	May 3 1955	Apr. 26 1955	Month Ago	Apr. Average
(1947-1949=100)	144.8	144.8†	144.7	144.8

†Revised.

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended May 3

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.525
Rails, Light, 40 lb	5.917
Tie Plates	5.275
Axles, Railway	7.500
Wheels, Freight Car, 33 in. (per wheel)	48.500
Plates, Carbon	4.675
Structural Shapes	4.517
Bars, Tool Steel, Carbon (lb)	0.430
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.80 (lb)	1.115
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., Alloy	8.875
Bars, H.R., Stainless, 303 (lb)	0.423
Bars, H.R., Carbon	5.600
Bars, Reinforcing	4.963
Bars, C.F., Carbon	6.160
Bars, C.F., Alloy	11.375
Bars, C.F., Stainless, 302 (lb)	0.438
Sheets, H.R., Carbon	4.870
Sheets, C.R., Carbon	5.864
Sheets, Galvanized	7.220
Sheets, C.R., Stainless, 302 (lb)	0.553
Sheets, Electrical	$9.350
Strip, C.R., Carbon	7.493
Strip, C.R., Stainless, 430 (lb)	0.415
Strip, H.R., Carbon	5.075
Pipe, Black, Buttweld (100 ft)	15.000
Pipe, Galv., Buttweld (100 ft)	18.605
Pipe, Line (100 ft)	146.804
Casing, Oil Well, Carbon (100 ft)	154.216
Casing, Oil Well, Alloy (100 ft)	227.575
Tubes, Boiler (100 ft)	‡
Tubing, Mechanical, Carbon	‡
Tubing, Mechanical, Stainless, 304 (100 ft)	‡
Tin Plate, Hot-dipped, 1.25 lb	8.533
Tin Plate, Electrolytic, 0.25 lb	7.233
Black Plate, Canmaking Quality	6.333
Wire, Drawn, Carbon	8.075
Wire, Drawn, Stainless, 430 (lb)	0.546
Bale Ties (bundle)	5.860
Nails, Wire, 8d Common	7.515
Wire, Barbed (80-rod spool)	7.127
Woven Wire Fence (20-rod roll)	16.925

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	May 4 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 avg.=100)	194.53	194.53	194.53	189.74	156.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$118.45	$118.45	$118.45	$113.70	$93.23
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	35.33	36.00	37.41	27.33	30.67

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 84; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	May 4 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	4.405	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pittsburgh	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.65	4.35-.40
Wire, Basic, Pittsburgh	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin Plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50

SEMIFINISHED STEEL

Billets, Forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire Rods, ½-⅝" Pitts.	4.675	4.675	4.675	4.525	3.85

PIG IRON, Gross Ton

Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne.	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$35.50	$35.00	$38.50	$28.50	$36.00
No. 1 Heavy Melt, E. Pa.	36.50	37.50	37.75	23.00	28.50
No. 1 Heavy Melt, Chicago	34.00	35.00	36.00	30.50	30.50
No. 1 Heavy Melt, Valley	34.50	35.50	37.50	29.50	35.25
No. 1 Heavy Melt, Cleve.	31.50	33.50	35.00	26.50	31.75
No. 1 Heavy Melt, Buffalo	30.50	32.50	32.50	25.50	29.75
Rails, Rerolling, Chicago	52.50	52.50	52.50	41.00	48.50
No. 1 Cast, Chicago	40.50	40.50	41.50	38.50	42.50

COKE, Net Ton

Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$14.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	16.00
Oven, Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

Daily Nonferrous Price Record

	Price May 4	Last Change	Previous Price	Apr. Avg.	Mar. Avg.	May 1954 Avg.
Copper	36.00	Mar. 29, 1955	33.00	36.000	33.223	30.000
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.800
Zinc	12.00	Apr. 6, 1955	11.80	11.927	11.800	10.290
Tin	91.375	May 3, 1955	91.125	91.458	87.194	93.600
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar. 21, 1955	27.00	28.500	27.556	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
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Nonferrous Metals

Demand for nonferrous metals remains at unprecedented high levels. Even if autoworkers strike this summer, the metal-hungry market would not fall apart

Nonferrous Metal Prices, Pages 122 & 123

AT THE HALFWAY MARK in the second quarter, producers of nonferrous metals are finding they probably never had it so good from the viewpoint of demand in an uncontrolled economy. There is still much to be desired in terms of supply, but with definite indications that the two are coming into balance at last, about the only real problem facing the metals industry is coming labor talks.

Demand for copper, aluminum, lead and zinc continues to hold at unprecedented levels. Threat of an autoworkers' strike this summer has not dampened forward buying in any of these metals, which is some indication of confidence in a peaceful settlement of current contract negotiations. Or it may be an indication that too much importance has been placed on the role of the auto industry in our metals economy.

Just Supposin'—Suppose the autoworkers went on strike for a month. At present rates that would represent about 700,000 units lost to production. At 43 lb of copper per car, that would mean about 15,000 tons would not be consumed by automakers. That tonnage would be gobbled up by other copper users like a steak before a starving man.

Estimates for the amount of aluminum in the average 1955 model vary. If we settle for about 20 lb, loss of a month's production in motordom would free about 7000 tons of aluminum for other uses. That's not much when you consider that many industry men thought the recent governmental release of 75,000 tons was insufficient to ease the shortage.

Still Charged Up—Lead would lose some of its current activity, but the battery industry—the big automotive user of lead—wouldn't notice it too much. The loss would be about 700,000 batteries, a drop in the bucket for a market anticipating almost 32 million units this year.

As for zinc, the loss would be felt probably more than the others because of the push the industry is putting on diecastings for auto front-end treatment this year. However, at about 20 lb of zinc per car, the loss would be only about 7000 tons out of a total diecasting market estimated at 285,000 to 300,000 tons this year.

At that, the letup might give producers a chance to catch up on the supply end. Stocks of special high-grade zinc are practically non-existent. At the American Zinc Institute meeting, one producer estimated his special high-grade stocks amounted to 8 hours, "and that's no stock at all," he said. Consumers other than auto suppliers also are screaming for the metal and might be glad to see an extra 700 tons on the market.

This is not by way of begging for a strike in the auto industry. Nobody would profit by it. The indirect effect would be serious. But the bottom would not fall out of the market if it happened.

STEEL's Metal Price Averages for April, 1955

(Cents per lb)

Electrolytic Copper, deld. Connecticut	36.000
Lead, St. Louis	14.800
Prime Western Zinc, E. St. Louis, Ill.	11.927
Straits Tin, New York	91.458
Primary Aluminum Ingots, deld.	23.200
Magnesium, Freeport, Tex.	28.500
Nickel, f.o.b. refinery	64.500

Copper Stability Coming?

May 2, 1955, could well be referred to in the future as the day stability was restored to the copper market. That could be the ultimate effect of the decision of the Rhodesian Selection Trust group of companies to sell copper at fixed prices to United Kingdom customers. Roan Antelope Copper Mines Ltd. and Mufulira Copper Mines Ltd. supply about one-third of Great Britain's copper. Even though the Rhokana group has not followed suit, if a third of the London market were stable, it would be a damper on any future gyrations of copper's price on the London Metal Exchange.

The immediate effects of the action were unknown at presstime. The London price of copper had been edging down for several days preceding the announcement, forward copper coming within a cent and a half of the domestic price of 36 cents a pound. The copper companies gave as reasons for the move the wide disparities between the London and U. S. price and the danger of such fluctuations to copper's competitive position with aluminum. Perhaps the sliding London price was an important element, too. The fixed price was not announced by the middle of last week.

Aluminum Setaside Down

Aluminum setasides for defense use in the third quarter will be slightly less than in the second quarter, Business & Defense Services Administration announced. Producers have been instructed to reserve 133 million lb of sheets, bars, rods and other mill products to cover defense and atomic energy orders in September, October and November. Setasides for the second quarter were 135 million lb. The third-quarter reserve represents about 15 per cent of the total anticipated mill supply during that period.

Opinions Differ on Zinc Price

A well-known producer of lead and zinc told STEEL that producers would like to see a combined price of 28.5 cents for the metals—15 cents for lead and 13.5 cents for zinc. With the proper pressure, this official thinks zinc could go up at any time to 12.5 cents. "You could sell just as much zinc today at 12.5 cents as you can at 12," he claimed.

Simon D. Strauss, vice president of American Smelting & Refining Co., told lead and zinc producers in Chicago that any material increase in the zinc price would damage the industry. David Laine, secretary, American Die Casting Institute, said that operation in that industry would be adversely affected by such an increase.

Market Memos

- Aluminum Co. of America increased its quantity extra charges for sheet and plate by 0.2 to 1 cent a pound to offset higher production costs.
- Nathan Trotter & Co. brands as false four of the five conclusions reached by the Senate committee which recommended continuation of operations at the Texas City, Tex., tin smelter.

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Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.50; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.20; No. 195, 4.5% Cu, 0.8% Si, 25.50; No. 214, 3.8% Mg, 26.20; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, $395 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$120 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 99 + %, $13-$18, f.o.b. Minneapolis, depending on quantity and form. For rod, add $2 a lb; for wire, add $3 a lb.

Magnesium: 99.8%, self-palletizing pig 28.50; notched ingot 29.30, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.3 in. diameter, 49.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $315-$318 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.00 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.02.

Osmium: $120-$130, nom., per troy oz.

Palladium: $17-$20 per troy oz.

Platinum: $76-$80 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$50 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 87.00 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $88.70 per lb; powder $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot, 91.375; prompt, 91.25.

Titanium: Sponge, 99.3+ %, grade A-1 ductile (0.1% Fe max) $3.95, grade A-2 (0.5% Fe max) $3.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 12.00; brass special, 12.25; intermediate, 12.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.35; special high grade, 13.50. Diecasting alloy ingot No. 3, 16.00; Nos. 2 and 5, 16.50.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy, 28.50-29.50; No. 12 foundry alloy (No. 2 grade), 27.25-28.50; 5% silicon alloy, 0.60 Cu max, 29.25-30.25; 13 alloy, 0.60 Cu max, 29.25-30.25; 195 alloy, 29.00-30.25; 108 alloy, 28.00-29.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 28.25-29.00; grade 2, 27.25-28.50; grade 3, 26.50-28.00; grade 4, 25.00-27.50.

Brass Ingot: Red brass No. 115, 35.50; tin bronze No. 225, 47.50; No. 245, 40.75; high-leaded tin bronze No. 305, 39.00, No. 1 yellow, No. 405, 30.75; manganese bronze No. 421, 33.25.

Magnesium Alloy Ingot: AZ63A, 31.00; AZ91B, 26.00; AZ91B, 31.00; AZ92A, 31.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.74; rod, bar, wire, $1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35-42.45; 30,000-lb lots, 41.48-42.58; l.c.l., 41.98-43.08. Weatherproof, 100,000 lb, 40.78-41.60; 30,000 lb, 41.03-41.85; l.c.l., 41.53-42.35. Magnet wire deld., 15,000 lb or more, 48.15-49.31; l.c.l., 48.90-50.06.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $9; hot-rolled and forged bars, $9.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 19.50-20.50; plates, 18.50-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1.00a per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks		66	

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0		
0.156-0.172	58.9	52.3		
0.188	53.9	52.3		58.8
0.219-0.234	51.1	49.5		
0.250-0.281	51.1	49.5		53.7
0.313	51.1	49.5		50.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3		48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4		
1.625-2.000	46.1	42.8		47.2
2.125-2.500	44.0	41.7		
2.563-3.375	42.7	40.5		

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.126	35.9	40.4	...	...
0.125-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.038	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.2
0.029-0.024	39.7	45.8	36.3	41.8
0.023-0.019	40.4	46.9	37.1	43.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.5
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	35.6
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.10	2	$ 49.55
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 89.00, 30,000 lb or more, 0.250 in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 62.00, 30,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in., 72.20; 1 x 4 in., 67.00. Rod, 1 in., 69.00; 2 in., 66.50. Tubing, 1 in. OD x 0.065 in., 90.00. Angles, 1 x 1 x ⅛-in., 75.90; 2 x 2 x ¼-in., 70.00. Channels, 5 in., 70.90. I-beams, 5 in., 70.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 17.00-18.50; old sheet, 13.50-16.00; borings and turnings, 9.50-10.00; crankcases, 13.50-16.00; industrial castings, 13.50-16.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.76b	52.38c	....	54.82	32.000	32.000	31.250
Yellow Brass	46.27	46.21d	46.81	49.15	33.875	34.625	33.000
Red Brass, 85%	50.99	50.93	51.53	53.80	38.125	37.875	37.375
Low Brass, 80%	49.75	49.69	50.29	52.56	37.000	36.750	36.750
Naval Brass	49.99	44.30	57.06	53.15	22.125	21.875	21.375
Com. Bronze, 90%	52.78	52.72	53.32	55.34	39.250	39.000	38.500
Nickel Silver, 10%	60.20	62.53g	62.53	....	27.625	27.375	13.813
Phos. Bronze, A, 5%	73.93	73.53	73.53	74.71	32.250	32.000	31.000
Silicon Bronze	58.82	58.01	58.34	60.80e	31.125	30.875	30.125
Manganese Bronze	53.73	47.53	58.24	....	23.125	21.875	21.375
Muntz Metal	48.14	43.95	....	....	22.375	22.125	21.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 30,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 29.50-30.50; No. 2 copper, 28.00-29.50; light copper, 26.00-27.50; No. 1 composition red brass, 25.00-25.50; No. 1 composition turnings, 24.00-24.50; yellow brass turnings, 16.00; new brass clippings, 21.00-22.00; No. 1 brass rod turnings, 18.50-20.00; light brass, 16.00-16.50; heavy yellow brass, 17.50-18.50; new brass rod ends, 19.00-21.00; auto radiators, unsweated, 18.50-19.00; cocks and faucets, 19.00-21.00; brass pipe, 19.00-21.00.
Lead: Heavy, 11.50-11.75; battery plate, 6.00-6.75; linotype and stereotype, 13.50-14.25; electrotype, 12.00-12.50; mixed babbitt, 12.00-14.00.
Magnesium: Clippings 18.50-19.50; clean castings 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.
Monel: Clippings 28.00-34.00; old sheet 28.00-30.00; turnings 21.00; rods 28.00-34.00.
Nickel: Sheets and clips 57.00-70.00; rolled anodes 57.00-70.00; turnings 49.00-55.00; rod ends 57.00-70.00.
Tin: No. 1 pewter 50.00-55.00; block tin pipe 70.00-75.00; No. 1 babbitt 45.00-48.00.
Zinc: Old zinc 4.75-5.50; new die cast scrap 4.75-5.00; old die cast scrap 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Aluminum: 1100 clippings, 19.00-20.50; 3003 clippings, 19.00-20.50; 6151 clippings, 19.00-20.50; 5052 clippings, 19.00-20.50; 2014 clippings, 18.00-19.50; 2017 clippings, 18.00-19.50; 2024 clippings, 18.00-19.50; mixed clippings, 18.00-19.50; old sheet, 16.00-18.00; old cast, 16.00-18.00; clean old cable (free of steel), 19.00-19.50; borings and turnings, 17.00-18.00.
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.
Copper, Brass: No. 1 copper, 33.00; No. 2 copper, 31.50; light copper, 29.75; refinery brass (60% copper) per dry copper content, 29.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)
Copper, Brass: No. 1 copper, 32.00-33.00; No. 2 copper, 30.50-31.50; light copper, 28.75-29.75; No. 1 composition borings, 26.50-27.50; No. 1 composition solids, 27.00-28.00; heavy yellow brass solids, 20.00-21.00; yellow brass turnings, 20.00-20.50; radiators, 20.50-22.00.

PLATING MATERIAL

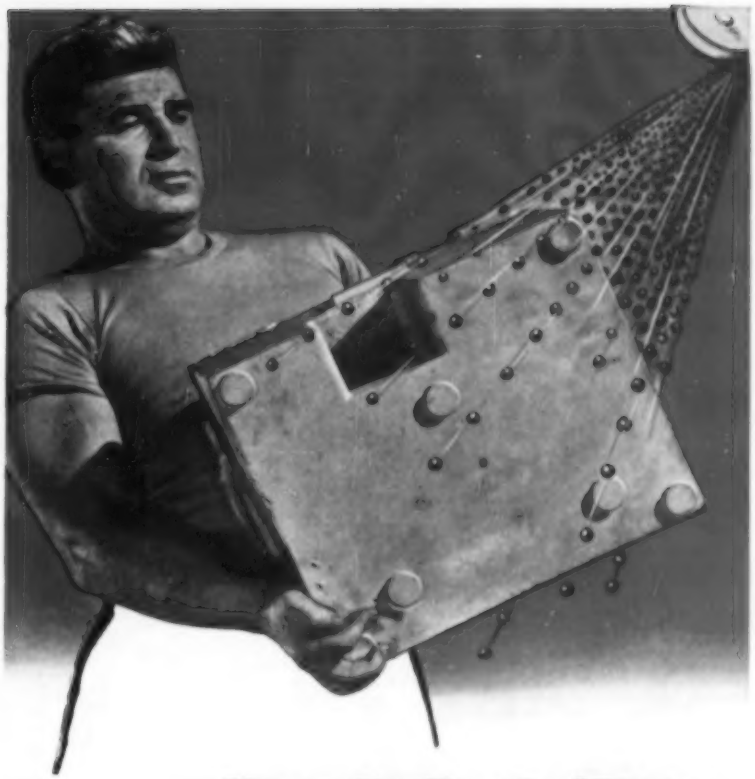
(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.
Copper: Flat-rolled 51.42, oval 50.92, 5000-10,000 lb; electrodeposited 49.40, 2000-5000 lb lots; cast 50.54, 5000-10,000 lb quantities.
Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 95.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.
Tin: Bar or slab, less than 200 lb, $1.095; 200-499 lb, $1.08; 500-999 lb, $1.075; 1000 lb or more, $1.07.
Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.
Copper Cyanide: 100 lb 76.80; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.
Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.
Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.
Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.
Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb, 70.10; 100-600 lb, 55.90; 700-1900 lb, 53.40; 2000-9900 lb, 51.70; 10,000 lb or more, 50.60.
Stannous Chloride (Anhydrous): Less than 50 lb, $1.558; 50 lb, $1.218; 100-300 lb, $1.068; 400-900 lb, $1.043; 1000-1900 lb, $1.019; 2000-4900 lb, 98.20; 5000-19,900 lb, 92.10; 20,000 lb or more, 86.00.
Stannous Sulphate: Less than 50 lb, $1.258; 50 lb, 96.80; 100-1900 lb, 93.80; 2000 lb or more, 91.80.
Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.



HOW RUGGED IS YOUR ABRASIVE?

Is it rugged enough to prove itself in performance? You can't judge an abrasive by looks, claims or promises. The only test of any abrasive is its *cost per ton of castings cleaned.* Because of exclusive metallurgical characteristics, Malleabrasive gives you the lowest cost per ton cleaned of any premium abrasive on the market! This has been proved in hundreds of production tests by users throughout the country. Prove it in your own production test. *We GUARANTEE that Malleabrasive will give you lowest cost per ton of castings cleaned.*

To order Malleabrasive, or for additional information on running a test, contact Globe Steel Abrasive Co., Mansfield, Ohio.

U. S. Patent #2184926 (Other patents pending)

MALLEABRASIVE

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company. Key on page 125. Key to footnotes, page 127.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ..... $61.50

INGOTS, Alloy (NT)

Detroit R7 ..... $65.00
Houston S5 ..... 70.00
Midland,Pa. C18 ..... 65.00
Munhall,Pa. U5 ..... 68.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ..... $64.00
Bessemer,Pa. U5 ..... 64.00
Bridgeport,Conn. N19 .. 69.00
Buffalo R3 ..... 64.00
Clairton,Pa. U5 ..... 64.00
Ensley,Ala. T2 ..... 64.00
Fairfield,Ala. T2 ..... 64.00
Fontana,Calif. K1 ..... 72.00
Gary,Ind. U5 ..... 64.00
Johnstown,Pa. B2 ..... 64.00
Lackawanna,N.Y. B2 .. 64.00
Lonestar,Tex. L6 ..... 70.00
Munhall,Pa. U5 ..... 64.00
Pittsburgh J5 ..... 64.00
So.Chicago,Ill. R2, U5 .. 64.00
So.Duquesne,Pa. U5 .. 64.00
Youngstown R3 ..... 64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ..... $78.00
Bessemer,Pa. U5 ..... 78.00
Bridgeport,Conn. N19 .. 83.00
Buffalo R3 ..... 78.00
Canton,O. R2 ..... 80.00
Clairton,Pa. U5 ..... 78.00
Conshohocken,Pa. A3 .. 83.00
Ensley,Ala. T2 ..... 78.00
Fairfield,Ala. T2 ..... 78.00
Fontana,Calif. K1 ..... 86.00
Gary,Ind. U5 ..... 78.00
Geneva,Utah C11 ..... 78.00
Houston S5 ..... 83.00
Johnstown,Pa. B2 ..... 78.00
Lackawanna,N.Y. B2 .. 78.00
LosAngeles B3 ..... 87.50
Midland,Pa. C18 ..... 78.00
Munhall,Pa. U5 ..... 78.00
Pittsburgh J5 ..... 78.00
Seattle B3 ..... 91.50
So.Chicago R3,U5,W14 .. 78.00
So.Duquesne,Pa. U5 .. 78.00
So.SanFrancisco B3 ... 87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ..... $86.00
Buffalo R3 ..... 86.00
Canton,O. R3, T7 ..... 86.00
Conshohocken,Pa. A3 .. 93.00
Detroit R7 ..... 86.00
Fontana,Calif. K1 ..... 105.00
Gary,Ind. U5 ..... 86.00
Houston S5 ..... 91.00
Ind.Harbor,Ind. Y1 ... 86.00
Johnstown,Pa. B2 ..... 86.00
Lackawanna,N.Y. B2 .. 86.00
LosAngeles B3 ..... 106.00
Massillon,O. R2 ..... 86.00
Midland,Pa. C18 ..... 86.00
Munhall,Pa. U5 ..... 88.00
So.Chicago R2,U5,W14 .. 86.00
So.Duquesne,Pa. U5 ... 86.00
Struthers,O. Y1 ..... 86.00
Warren,O. C17 ..... 86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R3 ..... $96.50
Canton,O. R2 ..... 96.50
Cleveland R2 ..... 96.50
Gary,Ind. U5 ..... 96.50
So.Chicago R2, W14 .. 96.50
So.Duquesne,Pa. U5 ... 96.50

SKELP

Aliquippa,Pa. J5 ..... 4.00
Fontana,Calif. K1 ..... 4.775
Lonestar,Tex. L6 ..... 4.30
Munhall,Pa. U5 ..... 3.90
SparrowsPoint,Md. B2 .. 3.90
Warren,O. R2 ..... 3.90
Youngstown R2, U5 .... 3.90

WIRE RODS

AlabamaCity,Ala. R2 .. 4.675
Aliquippa,Pa. J5 ..... 4.675
Alton,Ill. L1 ..... 4.85
Buffalo B11, W12 .... 4.675
Cleveland A7 ..... 4.675
Donora,Pa. A7 ..... 4.675
Fairfield,Ala. T2 ..... 4.675
Fontana,Calif. K1 .... 5.475
Houston S5 ..... 4.925
IndianaHarbor,Ind. Y1 . 4.675
Johnstown,Pa. B2 ..... 4.675
Joliet,Ill. A7 ..... 4.675
KansasCity,Mo. S5 .... 4.925
Kokomo,Ind. C10 ..... 4.775
LosAngeles B2 ..... 5.475
Minnequa,Colo. C10 ... 4.925
Monessen,Pa. P7 ..... 4.675
No.Tonawanda,N.Y. B11 4.675
Pittsburg,Calif. C11 ... 5.325
Portsmouth P12 ..... 4.675
Roebling,N.J. R5 ..... 4.775
So.Chicago,Ill. R2 ..... 4.675
SparrowsPoint,Md. B2 .. 4.775
Sterling,Ill.(1) N15 .... 4.675
Sterling,Ill. N15 ..... 4.775
Struthers,O. Y1 ..... 4.675
Torrance,Calif. C11 .... 5.475
Worcester,Mass. A7 ... 4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 ..... 4.25
Aliquippa,Pa. J5 ..... 4.25
Bessemer,Ala. T2 ..... 4.25
Bethlehem,Pa. B2 ..... 4.30
Birmingham C15 ..... 4.25
Clairton,Pa. U5 ..... 4.25
Fairfield,Ala. T2 ..... 4.25
Fontana,Calif. K1 ..... 4.90
Gary,Ind. U5 ..... 4.25
Geneva,Utah C11 ..... 4.25
Houston S5 ..... 4.30
Ind.Harbor,Ind. I-2 .... 4.25
Johnstown,Pa. B2 ..... 4.30
KansasCity,Mo. S5 ..... 4.30
Lackawanna,N.Y. B2 .. 4.30
LosAngeles B3 ..... 4.95
Minnequa,Colo. C10 .... 4.70
Munhall,Pa. U5 ..... 4.25
Niles,Calif. P1 ..... 4.90
Portland,Oreg. O4 ..... 5.00
Phoenixville,Pa. 4.20
Seattle B3 ..... 5.00
So.Chicago U5, W14 .... 4.25
So.SanFrancisco B3 .... 4.90
Torrance,Calif. C11 .... 4.95
Weirton,W.Va. W6 ..... 4.25

Wide Flange

Bethlehem,Pa. B2 ..... 4.30
Clairton,Pa. U5 ..... 4.25
Fontana,Calif. K1 ..... 5.25
Lackawanna,N.Y. B2 .. 4.30
Munhall,Pa. U5 ..... 4.25
Phoenixville,Pa. P4 .... 4.30
So.Chicago,Ill. U5 ..... 4.25

Alloy Stand. Shapes

Clairton,Pa. U5 ..... 5.20
Fontana,Calif. K1 ..... 6.60
Gary,Ind. U5 ..... 5.20
Houston S5 ..... 5.35
Munhall,Pa. U5 ..... 5.20
So.Chicago,Ill. U5 ..... 5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 ..... 6.40
Bessemer,Ala. T2 ..... 6.40
Bethlehem,Pa. B2 ..... 6.45
Clairton,Pa. U5 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Fontana,Calif. K1 ..... 7.05
Gary,Ind. U5 ..... 6.40
Geneva,Utah C11 ..... 6.40
Houston S5 ..... 6.45
Ind.Harbor,Ind. I-2, Y1 6.40
Johnstown,Pa. B2 ..... 6.45
KansasCity,Mo. S5 ..... 6.45
Lackawanna,N.Y. B2 .. 6.45
LosAngeles B3 ..... 7.10
Munhall,Pa. U5 ..... 6.40
Seattle B3 ..... 7.15
So.Chicago,Ill. U5, W14 6.40
So.SanFrancisco B3 .... 7.05
Struthers,O. Y1 ..... 6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ..... 6.45
Lackawanna,N.Y. B2 .. 6.45
Munhall,Pa. U5 ..... 6.40
So.Chicago,Ill. U5 ..... 6.40

PILING

BEARING PILES

Munhall,Pa. U5 ..... 4.25
So.Chicago,Ill. U5 ..... 4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ... 5.075
Lackawanna,N.Y. B2 .. 5.075
Munhall,Pa. U5 ..... 5.075
So.Chicago,Ill. U5 ..... 5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 ..... 4.225
Aliquippa,Pa. J5 ..... 4.225
Ashland,Ky.(15) A10 .. 4.225
Bessemer,Ala. T2 ..... 4.225
Bridgeport,Conn. N19 .. 4.475
Buffalo R2 ..... 4.225
Clairton,Pa. U5 ..... 4.225
Claymont,Del. C22 ..... 4.225
Cleveland J5, R2 ..... 4.225
Coatesville,Pa. L7 ..... 4.225
Conshohocken,Pa. A3 .. 4.225
Ecorse,Mich. G5 ..... 4.325
Fairfield,Ala. T2 ..... 4.225
Fontana,Calif.(30) K1 .. 4.875
Gary,Ind. U5 ..... 4.225
Geneva,Utah C11 ..... 4.225
GraniteCity,Ill. G4 .... 4.425
Harrisburg,Pa. C5 .... 4.225
Houston S5 ..... 4.275
Ind.Harbor,Ind. I-2, Y1 4.225
Johnstown,Pa. B2 ..... 4.225
Lackawanna,N.Y. B2 .. 4.225
Lonestar,Tex. L6 ..... 4.55
Mansfield,O. E6 ..... 4.225
Minnequa,Colo. C10 ... 5.075
Munhall,Pa. U5 ..... 4.225
Newport,Ky. N9 ..... 4.225
Pittsburgh J5 ..... 4.225
Riverdale,Ill. A1 ..... 4.225
Seattle B3 ..... 5.125
Sharon,Pa. S3 ..... 4.225
So.Chicago R2, U5, W14 4.225
SparrowsPoint,Md. B2 .. 4.225
Steubenville,O. W10 .... 4.225
Warren,O. R2 ..... 4.225
Weirton,W.Va. W6 .... 4.225
Youngstown R2,U5,Y1 .. 4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 .... 6.025
Geneva,Utah C11 ..... 5.375

PLATES, Wrought Iron

Economy,Pa. B14 ..... 9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.45
Bessemer,Ala. T2 ..... 6.45
Clairton,Pa. U5 ..... 6.45
Cleveland J5, R2 ..... 6.45
Coatesville,Pa. L7 ..... 6.45
Conshohocken,Pa. A3 .. 6.45
Ecorse,Mich. G5 ..... 6.55
Fairfield,Ala. T2 ..... 6.45
Fontana,Calif.(30) K1 .. 7.15
Gary,Ind. U5 ..... 6.45
Geneva,Utah C11 ..... 6.45
Houston S5 ..... 6.50
Ind.Harbor,Ind. I-2, Y1 6.45
Johnstown,Pa. B2 ..... 6.45
Lackawanna,N.Y. B2 .. 6.45
LosAngeles B3 ..... 7.35
Munhall,Pa. U5 ..... 6.45
Pittsburgh J5 ..... 6.45
Seattle B3 ..... 7.35
Sharon,Pa. S3 ..... 6.45
So.Chicago,Ill. U5, W14 6.45
SparrowsPoint,Md. B2 .. 6.45
Youngstown U5, Y1 .... 6.45

PLATES, Alloy

Claymont,Del. C22 .... 5.80
Coatesville,Pa. L7 ..... 5.80
Fontana,Calif. K1 ..... 6.45
Gary,Ind. U5 ..... 5.80
Houston S5 ..... 5.85
Ind.Harbor,Ind. Y1 ... 5.80
Johnstown,Pa. B2 ..... 6.80
Munhall,Pa. U5 ..... 5.80
Newport,Ky. N9 ..... 5.80
Seattle B3 ..... 6.70
Sharon,Pa. S3 ..... 5.80
So.Chicago,Ill. U5, W14 .. 5.80
SparrowsPoint,Md. B2 .. 5.80
Youngstown Y1 ..... 5.80

FLOOR PLATES

Cleveland J5 ..... 5.275
Conshohocken,Pa. A3 .. 5.275
Harrisburg,Pa. C5 ..... 5.275
Ind.Harbor,Ind. I-2 .... 5.275
Munhall,Pa. U5 ..... 5.275
So.Chicago,Ill. U5 ..... 5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10 .. 4.475
Ashland l.c.l. (15) A10 .. 4.975
Cleveland c.l. R3 ..... 4.825
Warren,O. c.l. R3 ..... 4.825

BARS

BAR, Hot-Rolled Carbon

Ala.City,Ala. R2 ..... 4.30
Aliquippa,Pa. J5 ..... 4.30
Alton,Ill. L1 ..... 4.50
Atlanta A11 ..... 4.50
Bessemer,Ala. T2 ..... 4.30
Birmingham C15 ..... 4.30
Bridgeport,Conn. N19 .. 4.55
Buffalo R2 ..... 4.30
Canton,O. R2 ..... 4.40
Clairton,Pa. U5 ..... 4.30
Cleveland R2 ..... 4.30
Ecorse,Mich. G5 ..... 4.40
Emeryville,Calif. J7 .... 5.05
Fairfield,Ala. T2 ..... 4.30
FairlessHills,Pa. U5 .... 4.45
Fontana,Calif. K1 ..... 5.00
Gary,Ind. U5 ..... 4.30
Houston S5 ..... 4.55
Ind.Harbor,Ind. I-2, Y1 4.30
Johnstown,Pa. B2 ..... 4.30
Joliet,Ill. P22 ..... 4.30
KansasCity,Mo. S5 ..... 4.55
Lackawanna,N.Y. B2 .. 4.30
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 4.40
Midland,Pa. C18 ..... 4.30
Milton,Pa. M18 ..... 4.30
Minnequa,Colo. C10 .... 4.75
Niles,Calif. P1 ..... 5.00
N.Tonawanda,N.Y. B11 .. 4.30
Pittsburg,Calif. C11 .... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 ..... 5.05
Seattle B3, N14, P23 .... 5.05
So.Chicago R2,U5,W14 .. 4.30
So.Duquesne,Pa. U5 .... 4.30
So.SanFran.,Calif. B3 .. 5.05
Sterling,Ill.(1) N15 .... 4.30
Sterling,Ill. N15 ..... 4.40
Struthers,O. Y1 ..... 4.30
Torrance,Calif. C11 .... 5.00
Warren,O. R2 ..... 4.30
Weirton,W.Va. W6 ..... 4.30
Youngstown R2, U5 .... 4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .... 5.075
Bridgeport,Conn. N19 .. 5.225
Buffalo R2 ..... 5.075
Canton,O. R2, T7 ..... 5.075
Clairton,Pa. U5 ..... 5.075
Detroit R7 ..... 5.075
Ecorse,Mich. G5 ..... 5.175
Fontana,Calif. K1 ..... 6.125
FairlessHills,Pa. U5 .. 5.225
Gary,Ind. U5 ..... 5.075
Houston S5 ..... 5.326
Ind.Harbor,Ind. I-2, Y1 5.075
Johnstown,Pa. B2 ..... 5.075
KansasCity,Mo. S5 .... 5.325
Lackawanna,N.Y. B2 .. 5.075
LosAngeles B3 ..... 6.125
Massillon,O. R2 ..... 5.075
Midland,Pa. C18 ..... 5.075
So.Chicago R2,U5,W14 .. 5.075
So.Duquesne,Pa. U5 .... 5.075
Struthers,O. Y1 ..... 5.075
Warren,O. C17 ..... 5.075
Youngstown U5 ..... 5.075

BARS, H.R. Leaded Alloy

Warren,O. C17 ..... 5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.45
Bessemer,Ala. T2 ..... 6.45
Bethlehem,Pa. B2 ..... 6.45
Clairton,Pa. U5 ..... 6.45
Cleveland R2 ..... 6.45
Ecorse,Mich. G5 ..... 6.55
Fairfield,Ala. T2 ..... 6.45
Fontana,Calif. K1 ..... 7.70
Gary,Ind. U5 ..... 6.45
Houston S5 ..... 6.70
Ind.Harb.,Ind. I-2, Y1 .. 6.45
Johnstown,Pa. B2 ..... 6.45
KansasCity,Mo. S5 .... 6.70
Lackawanna,N.Y. B2 .. 6.45
LosAngeles B3 ..... 7.15
Pittsburgh J5 ..... 6.45
Seattle B3 ..... 7.20
So.Chicago W14 ..... 6.45
So.Duquesne,Pa. U5 .... 6.45
So.SanFrancisco B3 .... 7.20
Struthers,O. Y1 ..... 6.45
Warren,O. R2 ..... 6.45
Youngstown U5 ..... 6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 ..... 4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 ..... 4.30
Atlanta A11 ..... 4.50
Fontana,Calif. K1 ..... 5.00
Niles,Calif. P1 ..... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 ..... 5.05
SanFrancisco S7 ..... 4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 ..... 5.20
Gary,Ind. U5 ..... 5.20
Houston S5 ..... 5.45
KansasCity,Mo. S5 .... 5.45
Youngstown U5 ..... 5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ..... 5.40
BeaverFalls,Pa. M12,R2 .. 5.40
Buffalo B5 ..... 5.45
Camden,N.J. P13 ..... 5.85
Carnegie,Pa. C12 ..... 5.40
Chicago W18 ..... 5.40
Cleveland A7, C20 ..... 5.40
Detroit R7 ..... 5.40
Detroit B5, P17 ..... 5.80
Donora,Pa. A7 ..... 5.40
Elyria,O. W8 ..... 5.40
FranklinPark,Ill. N5 ... 5.40
Gary,Ind. R2 ..... 5.40
GreenBay,Wis. F7 ..... 5.40
Hammond,Ind. L2, M13 .. 5.40
Hartford,Conn. R2 ..... 5.90
Harvey,Ill. B5 ..... 5.40
LosAngeles R2, S30 .... 6.95
Mansfield,Mass. B5 .... 5.95
Massillon,O. R2, R8 ... 5.40
Midland,Pa. C18 ..... 5.40
Monaca,Pa. S17 ..... 5.40
Newark,N.J. W18 ..... 5.85
NewCastle,Pa.(17) B4 .. 5.40
Pittsburgh J5 ..... 5.40
Plymouth,Mich. P5 ..... 5.85
Putnam,Conn. W18 ..... 5.95
Readville,Mass. C14 .... 5.95
So.Chicago,Ill. W14 .... 5.40
SpringCity,Pa. K3 ..... 5.85
Struthers,O. Y1 ..... 5.40
Waukegan,Ill. A7 ..... 5.40
Worcester,Mass. W19 .... 5.85
Youngstown F3, Y1 .... 5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19 .. 4.85

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ..... 6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 ..... 6.625
Buffalo B5 ..... 6.625
Camden,N.J. P13 ..... 6.80
Canton,O. T7 ..... 6.625
Carnegie,Pa. C12 ..... 6.625
Chicago W18 ..... 6.625
Cleveland A7, C20 ..... 6.625
Detroit R7 ..... 6.625
Detroit B5, P17 ..... 6.825
Donora,Pa. A7 ..... 6.625
Elyria,O. W8 ..... 6.625
Gary,Ind. R2 ..... 6.625
GreenBay,Wis. F7 ..... 6.625
Hammond,Ind. L2,M13 .. 6.625
Hartford,Conn. R2 ..... 6.925
Harvey,Ill. B5 ..... 6.625
Lackawanna,N.Y. B2 .. 6.625
LosAngeles S30 ..... 8.30
Mansfield,Mass. B5 .... 6.925
Massillon,O. R2, R8 .. 6.625
Midland,Pa. C18 ..... 6.625
Monaca,Pa. S17 ..... 6.625
Newark,N.J. W18 ..... 6.80
Plymouth,Mich. P5 .... 6.825
So.Chicago W14 ..... 6.625
SpringCity,Pa. K3 ..... 6.80
Struthers,O. Y1 ..... 6.625
Warren,O. C17 ..... 6.625
Waukegan,Ill. A7 ..... 6.625
Worcester,Mass. A7 .... 6.925
Youngstown F3, Y1 .... 6.625

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18 .... 7.525
Camden,N.J. P13 ..... 7.70
Carnegie,Pa. C12 ..... 7.525
Chicago W18 ..... 7.525
Cleveland C20 ..... 7.525
Monaca,Pa. S17 ..... 7.525
Newark,N.J. W18 ..... 7.70
SpringCity,Pa. K3 ..... 7.70
Warren,O. C17 ..... 7.525

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 ..... 4.30
Atlanta A11 ..... 4.50
Birmingham C15 ..... 4.30
Buffalo R2 ..... 4.30
Cleveland R2 ..... 4.30
Emeryville,Calif. J7 .... 5.05
Fairfield,Ala. T2 ..... 4.30
FairlessHills,Pa. U5 .... 4.45
Fontana,Calif. K1 ..... 5.00
Ft.Worth,Tex.(42) T4 .. 4.90
Gary,Ind. U5 ..... 4.30
Houston S5 ..... 4.55

Ind.Harbor,Ind. I-2, Y1 4.30
Johnstown,Pa. B2 ..... 4.30
Joliet,Ill. P22 ..... 4.30
KansasCity,Mo. S5 .... 4.55
Lackawanna,N.Y. B2 .... 4.30
LosAngeles B3 ..... 5.00
Milton,Pa. M18 ..... 4.30
Minnequa,Colo. C10 .... 4.75
Niles,Calif. P1 ..... 5.00
Pittsburg,Calif. C11 .... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 ..... 5.05
SandSprings,Okla. S5 .... 4.80
Seattle B3, N14, P23 .... 5.05
So.Chicago R2 ..... 4.30
So.Duquesne,Pa. U5 .... 4.30
So.SanFrancisco B3 .... 5.05
SparrowsPoint,Md. B2 .. 4.30
Sterling,Ill.(1) N15 .... 4.30
Sterling,Ill. N15 ..... 4.40
Struthers,O. Y1 ..... 4.30
Torrance,Calif. C11 .... 5.00
Youngstown R2, U5 .... 4.30

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2 .. 5.70
KansasCity,Kans. S5 .... 6.50
LosAngeles B3 ..... 5.95
Marion,O. P11 ..... 5.55
Pittsburgh J5, U8 ..... 5.72
Seattle B3, N14, P23 .... 6.15
So.SanFrancisco B3 .... 6.00
SparrowsPt. ¼-1" B2 .. 5.70
Williamsport,Pa. S19 .. 5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 ..... 4.25
ChicagoHts.(3) C2, I-2.. 4.20
ChicagoHts.(4) C2, I-2.. 4.30
Ft.Worth,Tex.(26) T4 .. 4.75
Franklin,Pa.(3) F5 .... 4.20
Franklin,Pa.(4) F5 .... 4.30
Marion,O.(3) P11 ..... 4.20
Moline,Ill(3) R2 ..... 4.30
Tonawanda(3) B12 .... 4.15
Tonawanda(4) B12 .... 4.30
Williamsport,Pa.(3) S19 4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks(S.R.) L5 .... 10.85
McK.Rks.(D.R.) L5 .... 14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 ..... 4.05
Allenport,Pa. P7 ..... 4.05
Ashland,Ky.(8) A10 .... 4.05
Cleveland J5, R2 ..... 4.05
Conshohocken,Pa. A3 .... 4.10
Detroit(8) M1 ..... 4.15
Dravosburg,Pa. U5 .... 4.05
Ecorse,Mich. G5 ..... 4.15
Fairfield,Ala. T2 ..... 4.05
FairlessHills,Pa. U5 .... 4.10
Fontana,Calif. K1 .... 4.825
Gary,Ind. U5 ..... 4.05
Geneva,Utah C11 ..... 4.15
GraniteCity,Ill. G4 .... 4.25
Ind.Harbor,Ind. I-2, Y1 4.05
Kokomo,Ind. C16 ..... 4.15
Lackawanna,N.Y. B2 .... 4.05
Mansfield,O. E6 (37) 4.05
Mansfield,O. E6 (38) 4.80
Munhall,Pa. U5 ..... 4.05
Newport,Ky. N9 ..... 4.05
Niles,O. N12 ..... 4.05
Pittsburg,Calif. C11 .... 4.75
Pittsburgh J5 ..... 4.05
Portsmouth,O. P12 .... 4.05
Riverdale,Ill. A1 ..... 4.06
Sharon,Pa. S3 ..... 4.06
So.Chicago,Ill. W14 .... 4.05
SparrowsPoint,Md. B2 .. 4.05
Steubenville,O. W10 .... 4.05
Warren,O. R2 ..... 4.05
Weirton,W.Va. W6 .... 4.05
Youngstown U6, Y1 .... 4.05

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 ..... 5.35
Kokomo,Ind. C16 ..... 5.20
Niles,O. N12 ..... 4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 .... 5.80
Youngstown Y1 ..... 5.80

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength Low-Alloy

Cleveland J5, R2 ..... 6.10
Conshohocken,Pa. A3 .... 6.15
Dravosburg,Pa. U5 .... 6.10
Ecorse,Mich. G5 ..... 6.20
Fairfield,Ala T2 ..... 6.10
FairlessHills,Pa. U5 .... 6.15
Fontana,Calif. K1 .... 6.875
Gary,Ind. U5 ..... 6.10
Ind.Harbor,Ind. I-2, Y1 6.10
Lackawanna(35) B2 .... 6.10
Munhall,Pa. U5 ..... 6.10
Pittsburgh J5 ..... 6.10
Sharon,Pa. S3 ..... 6.10
So.Chicago,Ill. U5 .... 6.10
SparrowsPoint(36) B2 .. 6.10
Warren,O. R2 ..... 6.10
Weirton,W.Va. W6 .... 6.10
Youngstown U5, Y1 .... 6.10

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 .... 4.30
Cleveland R2 ..... 4.65
Ind.Harbor,Ind. I-2 .... 4.30
Warren,O. R2 ..... 4.65

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 ..... 4.95
Cleveland J5, R2 ..... 4.95
Conshohocken,Pa. A3 .... 5.00
Dravosburg,Pa. U5 .... 4.95
Ecorse,Mich. G5 ..... 5.05
Fairfield,Ala. T2 ..... 4.95
FairlessHills,Pa. U5 .... 5.00
Follansbee,W.Va. F4 .... 4.95
Fontana,Calif. K1 .... 6.05
Gary,Ind. U5 ..... 4.95
GraniteCity,Ill. G4 .... 5.15
Ind.Harbor,Ind. I-2, Y1 4.95
Lackawanna,N.Y. B2 .... 4.95
Middletown,O. A10 .... 4.95
Newport,Ky. N9 ..... 4.95
Pittsburg,Calif. C11 .... 5.90
Pittsburgh J5 ..... 4.95
Portsmouth,O. P12 .... 4.95
SparrowsPoint,Md. B2 .. 4.95
Warren,O. R2 ..... 4.95
Weirton,W.Va. W6 .... 4.95
Youngstown Y1 ..... 4.95

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 ..... 7.50
Dravosburg,Pa. U5 .... 7.50
Ecorse,Mich. G5 ..... 7.60
FairlessHills,Pa. U5 .... 7.55
Fontana,Calif. K1 .... 8.55
Gary,Ind. U5 ..... 7.50
IndianaHarbor,Ind. Y1 .. 7.50
Lackawanna(37) B2 .... 7.50
Pittsburgh J5 ..... 7.50
SparrowsPoint(38) B2 .. 7.50
Warren,O. R2 ..... 7.50
Weirton,W.Va. W6 .... 7.50
Youngstown Y1 ..... 7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 ..... 5.55
Middletown,O. A10 .... 5.45
Warren,O. R2 ..... 5.55

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.50	7.10
Dravosburg U5	5.70	....
Fairfield T2	5.70	....
Gary,Ind. U5	5.70	5.95
Ind Harbor I-2	5.70	5.95
Kokomo,Ind. C16	5.80	....
MartinsFry. W10	5.70	....
Newport,Ky N9	5.70	5.95
Pitts.,Calif. C11	6.45	....
SparrowsPt, B2	5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 ..... 6.75
Gary,Ind. U5 ..... 5.95
MartinsFerry,O. W10 .... 5.95

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 ..... 5.45‡
Ashland,Ky. A10 ..... 5.45*
Butler,Pa. A10 ..... 5.45†
Canton,O. R2 ..... 5.45‡
Delphos,O. N16 ..... 6.10‡
Dover,O. R1 ..... 5.45‡
Dravosburg,Pa. U5 .... 5.45†
Fairfield,Ala. T2 ..... 5.45†
Gary,Ind. U5 ..... 5.45*
GraniteCity,Ill. G4 .... 5.65‡
Ind.Harbor,Ind. I-2 .... 5.45†
Kokomo,Ind. C16 ..... 5.55‡
MartinsFerry,O. W10 .. 5.45*
Middletown,O. A10 .... 5.45†
Newport,Ky. N9 ..... 5.45‡
Niles,O. N12 ..... 5.45‡
Pittsburg,Calif. C11 .. 6.20*
SparrowsPt.,Md. B2 .... 5.45‡
Warren,O. R2 ..... 5.45†
Weirton,W.Va. W6 .... 5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 .... 6.325

SHEETS, Galvanized
High-Strength Low-Alloy

Dravosburg,Pa. U5 .... 8.20
SparrowsPoint(30) B2 .. 8.20

SHEETS, Galvannealed Steel

Canton,O. R2 ..... 5.85
Dravosburg,Pa. U5 .... 5.85
Kokomo,Ind. C16 ..... 6.20
Newport,Ky. N9 ..... 5.85
Niles,O. N12 ..... 5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 .... 5.70
Canton,O. R2 ..... 6.20

SHEETS, Galvanized
Ingot Iron
(Hot-dipped Continuous)

Ashland,Ky. A10 ..... 5.70
Butler,Pa. A10 ..... 5.70
Middletown,O. A10 .... 5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 ..... 6.30
Niles,O.(28) R2 ..... 6.30
Weirton,W.Va. W6 .... 6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 ..... 8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 .... 5.375
Cleveland R2 ..... 5.375
Dravosburg,Pa. U5 .... 5.375
Gary,Ind. U5 ..... 5.375
GraniteCity,Ill. G4 .... 5.575
Ind.Harbor,Ind. I-2 .... 5.375
Middletown,O. A10 .... 5.375
Niles,O. N12 ..... 5.375
Youngstown Y1 ..... 5.375

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 .. 7.375
Follansbee(23) F4 ..... 6.60
Yorkville,O. W10 .... 7.375

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 ..... 5.85
Mansfield,O. E6 ..... 5.85
Middletown,O. A10 .... 5.85
Niles,O. N12 ..... 5.85
Weirton,W.Va. W6 .... 5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .... 6.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Josiyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.High Carb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Ruebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...4.05
Allenport,Pa. P7 ...4.05
Alton,Ill. L1 ...4.225
Ashland,Ky.(8) A10 ...4.05
Atlanta A11 ...4.25
Bessemer,Ala. T2 ...4.05
Birmingham C15 ...4.05
Bridgeport,Conn. N19 ...4.30
Buffalo(27) R2 ...4.05
Conshohocken,Pa. A3 ...4.10
Detroit M1 ...4.15
Ecorse,Mich. G5 ...4.15
Fairfield,Ala. T2 ...4.05
Fontana,Calif. K1 ...4.825
Gary,Ind. U5 ...4.05
Ind.Harbor,Ind. I-2, Y1 ...4.05
Johnstown,Pa.(25) B2 ...4.05
Lackaw'na,N.Y.(25) B2 ...4.05
LosAngeles(25) B3 ...4.80
Milton,Pa. M18 ...4.05
Minnequa,Colo. C10 ...5.15
N.Tonawanda,N.Y. B11 ...4.05
Pittsburg,Calif. C11 ...4.80
Portsmouth,O. P12 ...4.05
Riverdale,Ill. A1 ...4.05
SanFrancisco S7 ...5.00
Seattle(25) B3, P23 ...5.05
Seattle N14 ...5.05
Sharon,Pa. S3 ...4.05
Sr.Chicago,Ill. W14 ...4.05
So.SanFrancisco(25) B3 ...4.80
SparrowsPoint,Md. B2 ...4.05
Sterling(1) N15 ...4.05
Sterling,Ill. N15 ...4.15
Torrance,Calif. C11 ...4.80
Warren,O. R2 ...4.05
Weirton,W.Va. W6 ...4.05
Youngstown U5 ...4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19 ...7.00
Carnegie,Pa. S18 ...6.70
Fontana,Calif. K1 ...8.10
Gary,Ind. U5 ...6.70
Ind.Harbor,Ind. Y1 ...6.70
LosAngeles B3 ...7.90
Newport,Ky. N9 ...6.70
Seattle P23 ...7.80
Sharon,Pa. S3 ...6.70
So.Chicago W14 ...6.70
Youngstown U5, Y1 ...6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 ...6.15
Conshohocken,Pa. A3 ...6.15
Ecorse,Mich. G5 ...6.25
Fairfield,Ala. T2 ...6.15
Fontana,Calif. K1 ...7.25
Gary,Ind. U5 ...6.15
Houston S5 ...6.40
Ind.Harbor,Ind. I-2, Y1 ...6.15
KansasCity,Mo. S5 ...6.40
Lackawanna,N.Y. B2 ...6.15
LosAngeles(25) B3 ...6.90
Seattle(25) B3, P23 ...7.15
Sharon,Pa. S3 ...6.15
So.SanFrancisco(25) B3 ...6.90
SparrowsPoint,Md. B2 ...6.15
Warren,O. R2 ...6.15
Weirton,W.Va. W6 ...6.15
Youngstown U5, Y1 ...6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...4.30
Warren,O. R2 ...4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 ...5.75
Baltimore T6 ...5.75
Boston T6 ...6.30
Cleveland A7, J5 ...5.75
Conshohocken,Pa. A3 ...5.80
Dearborn,Mich. D3 ...6.85
Detroit D2, M1, P20 ...5.85
Dover,O. G6 ...5.75
Ecorse,Mich. G5 ...5.85
Follansbee,W.Va. F4 ...5.75
Fontana,Calif. K1 ...7.50
FranklinPark,Ill. T6 ...5.85
Ind.Harbor,Ind. I-2 ...5.85
Ind.Harbor,Ind. Y1 ...5.75
Indianapolis C8 ...5.90
LosAngeles C1 ...7.80
Middletown,O. A10 ...5.75
NewBedford,Mass. R10 ...6.20
NewBritain(10) B15 ...5.75
NewCastle,Pa. B4, E5 ...5.75
NewHaven,Conn. A7 ...6.50
NewHaven,Conn. D2 ...6.20
NewKensington,Pa. A6 ..5.75
Pawtucket,R.I. R3 ...6.40
Pawtucket,R.I. N8 ...6.30
Pittsburgh J5 ...5.75
Portsmouth,O. P12 ...5.75
Riverdale,Ill. A1 ...5.85
Rome,N.Y.(32) R6 ...5.75
Sharon,Pa. S3 ...5.75
SparrowsPt.,Md. B2 ...5.75
Trenton,N.J.(31) R5 ...7.30
Wallingford,Conn. W2 ..6.20
Warren,O. B9, R2, T5 ..5.75
Weirton,W.Va. W6 ...5.75
Worcester,Mass. A7 ...6.60
Youngstown C8, Y1 ...5.75

STRIP, Cold-Rolled Alloy

Boston T6 ...12.80
Carnegie,Pa. S18 ...12.45
Cleveland A7 ...12.45
Dover,O. G6 ...12.45
Fontana,Calif. K1 ...14.56
FranklinPark,Ill. T6 ..12.45
Harrison,N.J. C18 ...12.45
Pawtucket,R.I. N8 ...12.80
Sharon,Pa. S3 ...12.45
Worcester,Mass. A7 ...12.75
Youngstown C8 ...12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5 ...8.60
Dearborn,Mich. D3 ...8.70
Dover,O. G6 ...8.60
Ecorse,Mich. G5 ...8.70
Ind.Harbor,Ind. Y1 ...8.60
Lackawanna,N.Y. B2 ..8.425

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	...
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	...	...
Detroit D2	5.85	8.25	9.20	10.95	...
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
NewBritain,Conn.(10) B15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	...
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	...
NewKensington,Pa. A6	5.75	8.05	9.00	11.15	...
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.30	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	6.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	...
Buffalo W12	...	...	12.90	...	...
FranklinPark,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	...	...
Youngstown C8	...	...	13.25	15.95	19.35

Pittsburgh J5 ...5.60
Sharon,Pa. S3 ...5.60
SparrowsPoint,Md. B2 ..5.425
Warren,O. R2 ...5.60
Weirton,W.Va. W6 ...5.60
STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 ...6.35

STRIP, Electrogalvanized

Cleveland A7 ...5.75*
Dover,O. G6 ...5.75*
Riverdale,Ill. A1 ...5.85*
Youngstown C8 ...5.75*
Warren,O. B9, T5 ...5.75*
Weirton,W.Va. W6 ...5.75*
Worcester,Mass. A7 ...6.60*

*Plus galvanizing extras.

Strip, Galvanized (Continuous)

Sharon,Pa. S3 ...6.15
Warren,O. B9 ...6.15

TIGHT COOPERAGE HOOP

Atlanta A11 ...4.775
Riverdale,Ill. A1 ...4.625
Sharon,Pa. S3 ...4.475
Youngstown U5 ...4.475

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	...	9.10	10.10	11.00
Brackenridge,Pa. A4	....	...	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	...	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.80†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

*Semiprocessed. †Fully processed only. ‡Coils annealed; semiprocessed ½c lower. §Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 ...$6.60
Dravosburg,Pa. U5 ...6.60
Fairfield,Ala. T2 ...6.70
FairlessHills,Pa. U5 ...6.70
Gary,Ind. U5 ...6.60
GraniteCity,Ill. G4 ...6.70
Ind.Harbor,Ind. I-2, Y1 ..6.60
Niles,O. R2 ...6.60
Pittsburg,Calif. C11 ...7.35
SparrowsPoint,Md. B2 ..6.70
Warren,O. R2 ...6.60
Weirton,W.Va. W6 ...6.60
Yorkville,O. W10 ...6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5 ...6.20
Follansbee,W.Va. F4 ...6.20
Gary,Ind. U5 ...6.20
GraniteCity,Ill. G4 ...6.30
Ind.Harbor,Ind. Y1 ...6.20
Yorkville,O. W10 ...6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5 ...$7.55
Gary,Ind. U5 ...7.85
Yorkville,O. W10 ...7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10 ...$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5 ...9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ...5.75
Aliquippa,Pa. J5 ...5.75
Alton,Ill. L1 ...5.925
Atlanta A11 ...5.95
Bartonville,Ill. K4 ...5.85
Buffalo W12 ...5.75
Chicago W13 ...5.75
Cleveland A7, C20 ...5.75
Crawfordsville,Ind. M8 ..5.85
Donora,Pa. A7 ...5.75
Duluth,Minn. A7 ...5.75
Fairfield,Ala. T2 ...5.75
Fostoria,O.(24) S1 ...5.95
Houston S5 ...6.00
Jacksonville,Fla. M8 ...6.27
Johnstown,Pa. B2 ...5.75
Joliet,Ill. A7 ...5.75
KansasCity,Mo. S5 ...6.00
Kokomo,Ind. C16 ...5.85
LosAngeles B3 ...6.70
Minnequa,Colo. C10 ...6.60
Monessen,Pa. P7 ...5.75
Newark 6-8 ga. I-1 ...6.40
No.Tonawanda B11 ...5.75
Palmer,Mass. W12 ...6.05
Pittsburg,Calif. C11 ...6.70
Portsmouth,O. P12 ...5.75
Rankin,Pa. A7 ...5.75
So.Chicago,Ill. R2 ...5.75
So.SanFrancisco C10 ...6.70
SparrowsPoint,Md. B2 ..5.85
Sterling,Ill.(1) N15 ...5.75
Sterling,Ill. N15 ...5.85
Struthers,O. Y1 ...5.75
Waukegan,Ill. A7 ...5.70
Worcester,Mass. A7 ...6.00

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 ...7.20
Alton,Ill. L1 ...7.375
Bartonville,Ill. K4 ...7.30
Buffalo W12 ...7.20
Cleveland A7 ...7.20
Donora,Pa. A7 ...7.20
Duluth,Minn. A7 ...7.20
Fostoria,O. S1 ...7.20
Johnstown,Pa. B2 ...7.20
LosAngeles B3 ...8.15
Milbury,Mass.(12) N6 ..7.50
Minnequa,Colo. C10 ...7.45
Monessen,Pa. P7, P16 ..7.20
Muncie,Ind. I-7 ...7.40
Palmer,Mass. W12 ...7.50
Pittsburg,Calif. C11 ...8.15
Portsmouth,O. P12 ...7.20
Roebling,N.J. R5 ...7.50
So.Chicago,Ill. R2 ...7.20
So.SanFrancisco C10 ...8.15
SparrowsPt.,Md. B2 ...7.20
Struthers,O. Y1 ...7.20
Trenton,N.J. A7 ...7.50
Waukegan,Ill. A7 ...7.20
Worcester A7,J4,T6,W12 ..7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5 ...6.90
Alton,Ill. L1 ...7.075
Buffalo W12 ...6.90
Cleveland A7 ...6.90
Donora,Pa. A7 ...6.90
Duluth,Minn. A7 ...6.90
Johnstown,Pa. B2 ...6.90
KansasCity,Mo. S5 ...7.50
LosAngeles B3 ...7.85
Minnequa,Colo. C10 ...7.075
Monessen,Pa. P7, P16..6.90
NewHaven,Conn. A7 ...7.20
Palmer,Mass. W12 ...7.20
Pittsburg,Calif. C11 ...7.85
Portsmouth,O. P12 ...6.90
Roebling,N.J. R5 ...7.20
So.Chicago,Ill. R2 ...6.90
So.SanFrancisco C10 ...7.85
SparrowsPoint,Md. B2 ..7.60
Struthers,O. Y1 ...6.90
Trenton,N.J. A7 ...7.20
Waukegan,Ill. A7 ...6.90
Worcester,Mass. A7 ...7.20

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 ...11.375
Bartonville,Ill. K4 ...11.30
Buffalo W12 ...11.20
Chicago W13 ...11.20
Cleveland A7 ...11.20
Crawfordsville,Ind. M8..11.30
Fostoria,O. S1 ...11.20
Jacksonville,Fla. M8 ...11.73
Johnstown,Pa. B2 ...11.20
Kokomo,Ind. C16 ...11.30
Minnequa,Colo. C10 ...10.95
Monessen,Pa. P16 ...11.20
Muncie,Ind. I-7 ...11.40
Palmer,Mass. W12 ...11.50
Roebling,N.J. R5 ...11.50
So.SanFrancisco C10 ..11.95
Waukegan,Ill. A7 ...11.20
Worcester,Mass. A7, T6..11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 ...9.90
Buffalo W12 ...9.90
Johnstown,Pa. B2 ...9.90
Minnequa,Colo. C10 ..10.025
Monessen,Pa. P16 ...9.90
Muncie,Ind. I-7 ...10.10
Portsmouth,O. P12 ...9.90
Roebling,N.J. R5 ...10.20
SparrowsPt.,Md. B2 ...10.00

ROPE WIRE	(A)
Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester,Mass. T6	9.65
Worcester,Mass. J4	10.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425‖
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.575
Buffalo W12	6.90 7.30†
Cleveland A7	6.90 ....
Crawfordsville M8	7.00 7.65
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.15 7.55†
Jacks'ville,Fla. M8	7.425 7.95
JohnstownB2(48)	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.15 7.55†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85 ....
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer,Mass. W12	7.20 7.60†
Pitts.,Calif. C11	7.85 8.25†
Portsmouth,O. P12	6.90 ....
Rankin A7	6.90 7.30†
So.Chicago R2	6.90 7.30**
So.S.Fran. C10	7.85 8.25**
SparrwsPt.B2(48)	7.00 7.55*
Sterling(1)(48)	N15 6.90 7.475
Struthers,O.(48)	Y1 6.90 7.40‡
Worcester,Mass.	A7 7.20 ....

*Based on 11c zinc; †5c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN Fence, 9-15½ Ga. Col.

Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga. J5	149‖
Atlanta A11	151
Bartonville,Ill. K4	*152*
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	151†
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	151†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	151**
Monessen,Pa. 9 ga. P17	149
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	150

†Based on 5c zinc; *11c zinc; ‖10c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	156
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	156
Fairfield,Ala. T2	156
Joliet,Ill. A7	155
Houston S5	160
KansasCity,Mo. S5	160
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	156
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	156

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	159**
Aliquippa J5	156‖
Atlanta A11	164
Bartonville,Ill. K4	165
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	164†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	164†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	164**
Monessen,Pa. P7	162
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
So.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	163

†Based on 5c zinc; *11c zinc; §10c zinc; **Subject to zinc equalization extras.

WIRE (16 Gage)

	An'ld Stone	Galv. Stone
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.15
Buffalo W12	13.15	....
Cleveland A7	13.15	....
Crawfrdsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mass.W12	13.15	14.70†
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.05
Waukegan A7	13.15	14.70†
Worcester A7	13.45	....

*Based on 11c zinc; †5c zinc; §10c zinc; **Subject to zinc equalization extras.

NAILS, Stock To Dealers & Mfrs. (7)

	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	145
Houston,Tex. S5	142
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	142
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg) To Dealers (33)

Conshohocken,Pa. A3	$6.30
Wheeling,W.Va. W10	6.30

STAPLES, Polished Stock To Dealers & Mfrs. (7)

	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	139
Crawfordsville,Ind. M8	139
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt.,Md. B2	140
Sterling,Ill.(1) N15	138
Worcester,Mass. A7	144

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	150
Duluth,Minn. A7	150
Franklin,Pa. F5	150
Johnstown,Pa. B2	150
Marion,O. P11	150
Minnequa,Colo. C10	155
Moline,Ill. R2	155
So.Chicago,Ill. R2	150
Tonawanda,N.Y. B12	150
Williamsport,Pa. S10	150

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
9/16-in. and ⅝-in.	+4
¾-in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
⅝" and smaller	55
¾" to 1⅛", inclusive	58
1¼" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	38
¾" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅛-in. through ⅝-in.	38
¾-in. through 1 in.	15
Longer than 6 in.:	
⅛-in. through ⅝-in.	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
7/16-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2½	12	34.63	41.52	33.59
2¾	12	38.15	45.74	37.00
3	12	41.31	49.53	40.07
3¼	12	44.05	52.82	42.72

RAILWAY MATERIALS

RAILS	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...	(16)5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.35
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S10	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	21.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed:	
Carlots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	31.25-39.75†
Bronze, 5000-lb lots	51.50-54.75†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	97.00
Nickel-Silver, 5000-lb lots	47.50-51.00
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	81.25
Tin	14.50*
Zinc, 5000-lb lots	17.25-31.00‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area, 4.95c.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.25c H.S.-L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.80c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.055" and narrower, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	3		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv.*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N3	13.5	..	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		¾		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. P6	25	+3.5	17	+ 8.5	9.5	+15	....	..	....	....	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless Hills, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+ 8.5	9.5	+15	....	..	....	....	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1¼		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.00c; East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat	C.R. Strip; Wire
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75	
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00	
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25	
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00	
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50	
304L	....	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50	
308	20.75	27.25	34.25	41.75	39.00	43.00	47.00	49.00	49.00	
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25	
309S	29.75	38.75	46.00	55.75	55.25	56.75	60.25	69.75	69.75	
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25	
314	....	....	....	....	....	....	71.00	....	....	
316	29.75	38.00	46.25	56.25	55.00	57.25	60.50	64.50	64.50	
316L	....	....	....	53.25	61.25	60.00	62.25	66.50	69.50	
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00	
321	23.50	30.25	38.00	41.50	41.75	42.75	46.50	51.25	51.25	
330	....	....	....	61.50	....	....	72.00	73.25	81.25	81.25
18-8CbTa	29.25	38.25	46.00	53.25	53.00	53.75	56.50	66.50	66.50	
403	....	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75	
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25	
414	....	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	....	24.50	26.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75	
430	14.25	18.50	24.50	25.25	27.00	29.25	30.50	34.75	34.75	
430F	....	....	....	25.00	26.75	....	29.75	....	....	....
431	15.00	19.25	25.00	26.75	26.00	29.75	31.00	35.75	35.75	
446	....	....	....	32.50	34.25	50.25	39.50	49.75	59.75	

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Chartier Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.00	35.30	34.25
347	32.20	38.60	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	34.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base—Cold-Rolled— 10%	Both Sides
Copper*	26.50	33.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S15.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	...		4.030
18.25	4.25	1	4.75	...		2.245-2.415
18	4	2	9	...		2.615
18	4	2	....	...		1.705
18	4	1	....	...		1.540
14	4	2	5	...		2.185
13.75	3.75	2	5	...		2.185
13.5	4	3	....	...		1.805
9	3.5	..	....	...		1.115
6	4	2	....	5		1.045
6	4	3	....	5		1.290
1.5	4	1	....	8.5		0.900

Tool steel producers include: A4, A8, B2, B5, C4, C9, C13, C18, D4, F2, J3, L3, M14, M6, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malleable	Bessemer
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.56	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.00	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	56.17	56.67	56.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	56.00	56.50	....	....
Chester,Pa. C31	....	49.50	49.00	....
Philadelphia, deld.	....	59.16	59.66	....
Steelton,Pa. B2	56.00	56.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	56.00	56.50	59.00	59.50
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L8	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50 Si to 10%; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$50.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	55.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	58.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	$61.00
Lyles,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Buffalo, 25 cents on C.R. and galvanized sheets, C.F. and alloy bars and 20 cents on other commodities; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡§	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140†‡		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.02‖	12.54	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25§	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	45.23¶	7.47	...	7.20	8.60	13.30	7.49	7.37	8.50
Buffalo	6.35	7.40	8.84	....	6.70	...	6.50	7.40	12.00	6.72	6.65	7.99
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.25	11.75	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.20	46.10	6.86	...	6.75	7.55	12.00	6.86	6.81	7.89
Cleveland	6.38	7.38	8.25	46.16	6.72	...	6.57	7.35	11.81	7.02	6.69	7.81
Detroit	6.57	7.67	8.58	43.50	6.90	7.36	6.79	7.54	11.95	7.16	6.80	7.82
Erie, Pa.	6.35	7.36	8.30	....	6.70	...	6.50	7.45*	....	6.69	6.52	7.64
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.30	....	7.60	7.25	8.75
Los Angeles	7.50	9.26	9.95	50.15	7.55	11.75	7.45	10.15	13.15	7.65	7.45	9.56
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.44	11.84	6.85	6.81	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.95	7.36	...	7.37	8.73*	12.13	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98*	6.96	8.80	6.74	7.86*	11.96	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	11.75	6.69	6.52	7.64
Portland, Oreg.	7.00	7.75	8.90	48.50	7.25	...	7.05	10.20	14.00	7.00	6.85	8.75
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.64*	12.04	7.09	6.81	7.92
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.91	....	7.35	7.13	8.30
San Francisco	7.55	8.95	9.40	51.65	7.80	...	7.35	10.05	13.05	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	51.00	8.20	...	7.80	10.95	13.50	7.75	7.80	9.60
Spokane	8.35	9.65†	10.15	....	7.80	...	7.80	10.85‖‖	14.25	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.27	...	7.28	9.09	....	7.21	7.05	8.14

*Prices do not include gage extras; †prices include gage and coating extras, based on 11.50-cent zinc except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **⅛-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb; stainless sheets, 5000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; §—500 to 9999 lb; ¶—4000 lb and over; ‖—1000 to 1999 lb; #—1000 lb and over; †—1500 to 3999 lb; ‖‖—2000 to 3999 lb; ¶¶—f.o.b. local delivery in lots of 10,000 lb and over.

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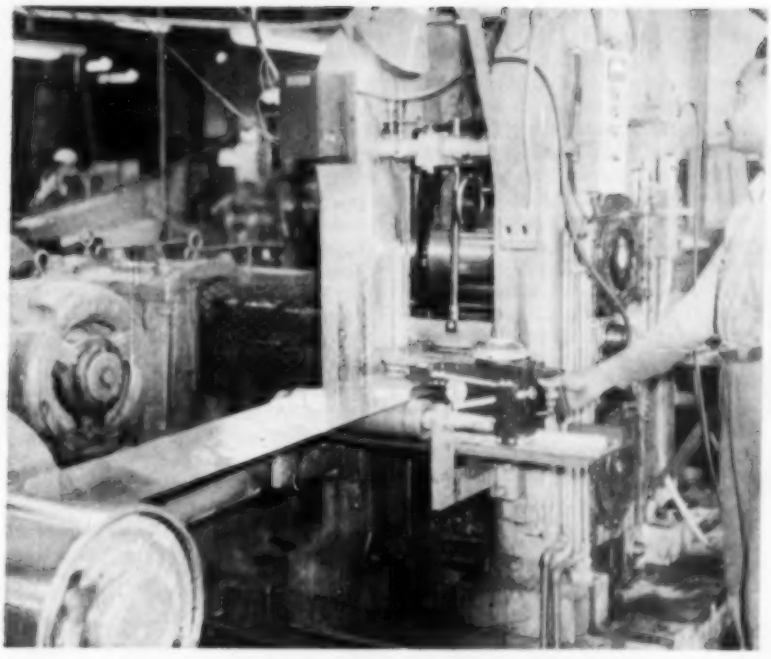


Equipment like this 4-high mill typifies a trend as . . .

Warehouses Tailor-Make Markets

DIVERSIFICATION is changing the face of the warehouse industry as it offers its customers an increasing variety of services—some of which are drawn straight from the pages of mill books. While they still play their traditional role as intermediaries between mills and fabricators, warehouses also are becoming prefabricators and industrial engineers of sorts.

Take the case of Eastern Brass & Copper Co. Inc., New York. It has adapted its operations to its markets. Result: A wide variety of special services and combinations of services. Herbert Barchoff, president of the company, says: "Sure, there are other companies which do some of the things we do, and there are some which offer services which we don't. But I doubt if you'll find any warehouse that duplicates the range of services we offer or the machinery we operate."

Ingenuity—That statement isn't hard to believe as you look around this modern plant. Much of the machinery never has seen the inside of another plant. That's because Eastern is in a way an engineering outfit as well as a warehouse.

Herb Barchoff and his associates—there are about 85 in the plant—thrive on jobs that mills and other warehouses don't want because they are "too out of the ordinary." If the job requires some special machinery, Mr. Barchoff, Jack Rothschild—vice president and a graduate engineer—and the boys in the machine shop put their heads together and devise the machine needed. Everybody gets into the act. They are encouraged to do so by a suggestion plan which pays cash rewards for useful ideas.

To the Rescue—For instance, an engineering firm required a stainless steel rod in a special shape not obtainable at the mills. It was needed to finish work on a Navy contract. The firm went to Eastern with blueprints, and the boys in the machine shop made a special roller for the job.

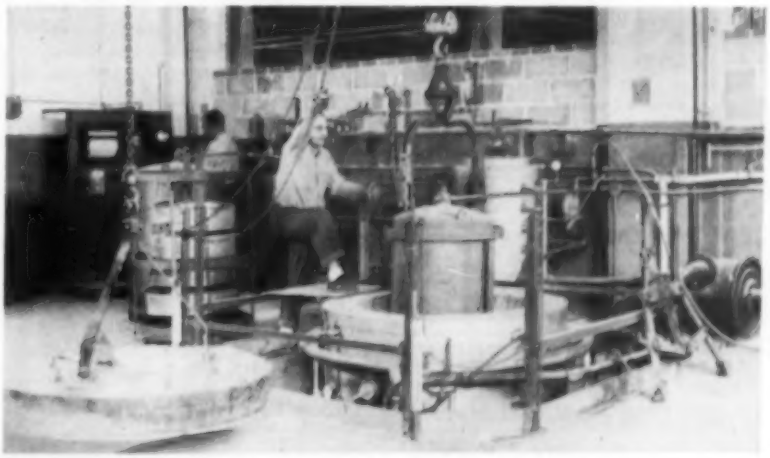
Such special machinery may cost a considerable amount of time and money, but "we've been stuck with our investment only once," Mr. Barchoff says. "Specs were changed on this particular job, and we didn't get the order. But we made a good friend by taking the time and effort to figure the problem out, and we still have the machinery. If that customer ever changes his mind about specifications, we're back in business."

In the meantime, Eastern probably will find another use for the machine.

Progressive — In many respects, this company is typical of the progressive warehouses which are shooting for that custom business that mills can't or won't take because they can't fit it into their schedules.

Eastern has the usual assortment of equipment for slitting, shearing, flattening, circling and round edging. It begins to depart from the ordinary with its controlled-atmosphere annealing furnace. It is one of the few warehouses in the country that has 2-high and 4-high, close-tolerance rolling mills. It probably is the only place in the country where you can find 213 patterns for embossing and engraving sheet metal and wire.

The furnace and rolling mills have been big factors in the growth of this company. Customers have found that they can save metal costs by bringing obsolete stock to Eastern, where proper heat treating and rerolling can change the temper and gage of the metal and make it useful. It



This controlled-atmosphere annealing furnace at Eastern Brass & Copper is one reason why the company can engineer its services to the demands of the market

It's an aluminum awning assembly, worth the lasting strength of Alcoa® Aluminum Fasteners. You avoid galvanic and atmospheric corrosion. You get perfect color match; you get the very highest quality product. Your local Alcoa distributor has a complete stock.

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then can be slit into any width the customer wants—and all this is done within the tightest time schedule.

Matter of Cost—Warehouses like Eastern Brass & Copper didn't spring into being overnight. They have been diversifying their services for the last 10 or 15 years. The need arose because labor and equipment costs have grown to a point where the individual manufacturer can't afford to perform these functions.

Today, an expensive slitter, for example, may lie idle 75 per cent of the time in a metalworking plant. That ties up capital that could be spent more efficiently for other machinery which would be used full time. The warehouseman buys a slitter, and, in effect, rents it to several manufacturers for a service charge.

Officials of the American Steel Warehouse Association say this trend in both steel and nonferrous warehouses will continue as long as labor and equipment costs remain high. Eastern Brass & Copper, and a few companies like it, are setting the pace.

Warehouse . . .

Warehouse Prices, Page 129

Bookings by steel distributors continue to gain momentum and may hit the year's peak late this month. Encouraging, too, is that buying is well diversified as to products and consuming industries. Orders are larger and more numerous, especially for sheet and construction materials.

Present buying pickup is viewed as healthy because the steel is needed for immediate and nearby production needs, in contrast with late 1952 and early 1953 demand when buying was mainly for inventory.

Prices are steady, with little change anticipated until perhaps July. At that time, if not sooner, higher mill prices may be posted because of increased wage rates.

Cincinnati district warehouses entered May with substantial carryover business from April. Most items can be readily replaced from stock, so that the gray market bugaboo has not reared its head.

Stainless Steel . . .

Stainless Steel Prices, Page 138

April shipments of electrical and stainless steel at Allegheny Ludlum Steel Corp., Pittsburgh, will be above the first-quarter rate, reports E. J. Hanley, president. He adds that new orders booked in April will exceed shipments. Barring a work stoppage, all signs point to a good third quarter for stainless steel.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 125 & 126

Sellers of hot and cold-rolled sheets, also galvanized, could readily book orders to capacity for the entire third quarter if they so desired. In fact, some of them have accepted business that far ahead. Others, however, are hesitant to commit themselves too far forward, pending clarification of the market outlook generally. All mills, though, are booked up solidly through July.

With higher steel prices a possibility after midyear (following a wage hike), it is difficult to appraise the actual consuming needs of users currently. Retooling of new auto models, now planned for August by some motorcar builders, may take off some of the demand pressure on the sheet mills. Still, producers of cold-rolled sheets may be entertaining more tonnage this summer than they can comfortably handle, even though vacation interruptions and hot weather should cutrail general manufacturing operations.

Specialties, particularly enameling stock and electrical sheets, are in active demand in the East, with producers sold well into the third quarter. Mill salesmen at Pittsburgh think third-quarter business will be surprisingly good should an auto strike be averted. July shipments, they say, will be heavy while something of a sag may be experienced in August, which may turn out to be the dullest month of the quarter.

Demand is unrelenting at Chicago. Automotive needs are pacing requirements for cold rolled, with the auto builders specifying all the tonnage they can get for July and August. So far they have shown relatively little interest in September needs. Indications are the second quarter carryover in the area will amount to four or five weeks production.

Users of cold-rolled sheets in New England are not sure as to the likely extent of any cutback in auto needs this summer. They expect there will be some decline in auto volume, but other consumer orders, scheduled for July to September rolling, appear sufficient to support near-capacity mill operations. Carryover tonnage and vacation production losses are certain to narrow openings in summer mill rolling schedules.

Producers are reported building order backlogs in stainless sheets. Some schedules are said to extend to September. Also, schedules extend about as far on electrical, enameling, galvanized and electrocoated sheets. That some of this buying is for in-

ventory seems apparent because pressure for deliveries is lacking despite the mill lag in meeting shipment promises.

Republic Steel Corp., Cleveland, has issued a revised list of extras on galvannealed sheets, effective Apr. 27. The previous list was dated Mar. 18, 1954. Changes are few, being confined to dimensional extras for gage and width, order quantity and item quantity extras and a couple minor changes in packaging extras.

Sharon Steel Corp., has contracted with the Gas Machinery Co., Cleveland, for two preheat furnaces to increase production in its Catenary-type strip annealing furnaces at its Farrell Works, Farrell, Pa.

Steel Bars . . .

Bar Prices, Page 134

Most leading producers of hot-rolled bars are booked up through July, and increasing tonnage is coming out for delivery beyond that month. Cold-drawn bars can still be had for delivery in July, but, in general, that month is pretty well booked up.

Jobbers are specifying less freely in the East, but volume is more than holding up in other directions. Deliveries on hot-rolled alloy have jumped to about seven weeks in some cases. On cold-drawn alloys shipments are even more extended. In the case of cold-drawn, limited supplies of hot stock provide the bottleneck rather than drawing facilities.

Buying is accelerating in the Chicago area. Mills there are finding it more difficult to accommodate customers because their rolling cycles are lengthening steadily. Possible higher prices in the third quarter are encouraging buying of tonnage that can be shipped this quarter. It is doubtful, however, if anyone is able to expand inventory appreciably.

Philadelphia sellers still have some tonnage left for July shipment. Their schedules for that month, however, are filling rapidly. Trading is diversified. Cold-finishers, who express satsfaction at the rate of incoming business, are concerned about supplies of hot stock required to meet pressing demands.

In New England, consumers are covering requirements for the third quarter more actively than was the case earlier this year. Order books are practically filled through June, although some alloy tonnage can be worked into schedules for that month.

Demand is fairly diversified at Pittsburgh and Cleveland, but automotive requirements continue outstanding at both points. Signs point to continued strong demand well in-

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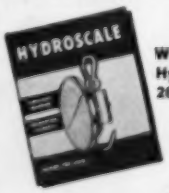

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to the third quarter. On the West Coast, reduced requirements for aircraft parts are reflected in some lessening in bar needs.

Plates . . .

Plate Prices, Page 134

Pressure for steel plates continues strong. Most producers are booked up solidly through July, and could book full for the entire third quarter. Little in the way of hedge buying against a price increase in the third quarter is now possible.

Supply continues to tighten steadily at Pittsburgh where the mills report prospects indicate strong demand throughout the third quarter. July sales are expected to be high, notably on line pipe, boilers and tanks. Even railroads are reported showing more interest in needs, though their total consumption is trailing that of recent years.

In the East, fabricators of oil storage tanks appear to be particularly bullish. This applies to shops turning out everything from household to field storage tanks. Electrical equipment makers also are active buyers, though the threat of a strike in the fall hangs over the industry. Fabricators, generally, are cutting up a lot of steel plate in the district, while ship and railroad business is undergoing a mild upswing. At New York, shipwork is confined largely to repairs, but demand is on the plus side, compared with a year ago.

Chemical requirements are disappointing to district sellers, and demand from boiler manufacturers is described as spotty. However, the over-all area market situation is brisk, with more tonnage moving through warehouses and efforts being expended by consumers to build up their inventories at a noticeably faster pace than at any time this year.

One leading mill in the Philadelphia area is booking August delivery tonnage only, preferring to take nothing beyond that month for the present. Other district sellers, except one, are booked up solidly through July. The exception should be booked full shortly.

West coast plate fabricators are optimistic, although small shops are having difficulty developing new business. Largest plate project pending in the district involves 1000 tons for Tacoma's (Wash.) Mayfield dam. Bids on this job have been postponed from May 27 to June 3. Some 3000 tons of reinforcing bars and 500 tons of shapes also are required for this project. Unstated plate tonnages are involved in storage tanks at six military installations in Alaska. Subcontracts for 450 tons to go into seven

Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season; gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-66%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$25.00-$26.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 55c-87c per long ton unit c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

56-60%	$3.25-$3.80
65%	4.15-4.25

Vanadium Ore

Cents per lb, V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Parber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $130; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa. $130; Philadelphia, $116; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $208; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.30; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $151; Danville, Ill., $169.20.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $220; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $255; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $156.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.80; Thornton, McCook, Ill., $15.10; Delly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¼-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, Ind., ovens	24.00
Milwaukee, ovens	25.20
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.56

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32.5$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

Threaded with nipple, unbored, f.o.b. plant

GRAPHITE

Diam (Inches)	Length (Inches)	Per 100 lb
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5½	40	28.25
6	60	26.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25

CARBON

8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	84	9.85
20	90	9.85
24	72, 84	9.85
24	96	9.60
30	84	9.75
40, 35	110	9.50
40	100	9.50

storage tanks at Adak, Alaska, were placed a week ago.

Lengthening deliveries are increasing in the Chicago market. District fabricators, with expanding business, are jolted to find they can't arrange for mills to accommodate their needs except on an extended shipment basis. The two biggest consuming influences are pipelines and freight car building and repair.

Heavier bookings have moved out plate deliveries to August in New England in the case of some producers. Tank requirements in the area are larger and some fabricating shops are buying for better inventory. The same is true of warehouses. Navy inquiry for May is ahead of that last month.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 134

General construction, roadwork and military installations in the Pacific Northwest and Alaska are seen providing substantial demand for reinforcing bars over the coming weeks. Currently, district rolling mills are operating at a much higher rate than a year ago, with order backlogs described as fair.

At Los Angeles, the spring flood of engineering construction is imparting a brisk tone to reinforcing business. Fabricators, however, are beating the bushes for orders. Competition continues keen.

Wire . . .

Wire Prices, Pages 126 & 127

Wire rod supplies are becoming increasingly tight, due particularly to requirements of converters. Wiremakers, generally, are entertaining good business in both merchant and manufacturers classifications. In the latter automotive requirements (direct and indirect) are setting the pace. As time goes on, the third quarter looks more promising to midwestern producers.

American Steel & Wire plants will close the first two weeks of July for the customary vacation period. This is being anticipated in shipping schedules.

Orders are geared close to consumption in New England. While some July and third-quarter volume is being booked, forward buying is usually against firm contract needs. Only on welded reinforcing fabric are backlogs heavy in the district, as most industrial users buy on a month-to-month basis and stress delivery with short lead time.

Tubular Goods . . .

Tubular Goods Prices, Page 128

All signs point to substantial third-quarter demand for tubular goods. Consuming industries plan no summer letdown in requirements. Well drilling is pushing shipments of seamless tube for oil country use to new heights. Orders are coming in for delivery well into the third quarter.

Standard seamless tube sales are strong and are expected to hold present levels through the second quarter. Mills are well booked through this quarter and are taking orders for the following three months. Butt-weld shipments continue to improve, although some tonnage still is available for shipment in the second quarter.

Cast iron pipe demand continues active in the Pacific Northwest. Awards are pending on about 700 tons in the area, while Yakima, Wash., will take bids May 9 for 200 tons. Also, an unstated tonnage is required for an Anchorage, Alaska, project, bids on which will be taken May 18.

Kaiser Steel Corp., Oakland, Calif., is offering to buy the large diameter pipe fabricating business of Basalt

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- only the work enters and leaves the furnace retort. Chains, conveyors, trays and other inefficient mechanisms are eliminated.
- alloy costs are decreased. The retort remains in the furnace at all times. Rotation and the use of an ample combustion chamber further assure maximum alloy life.
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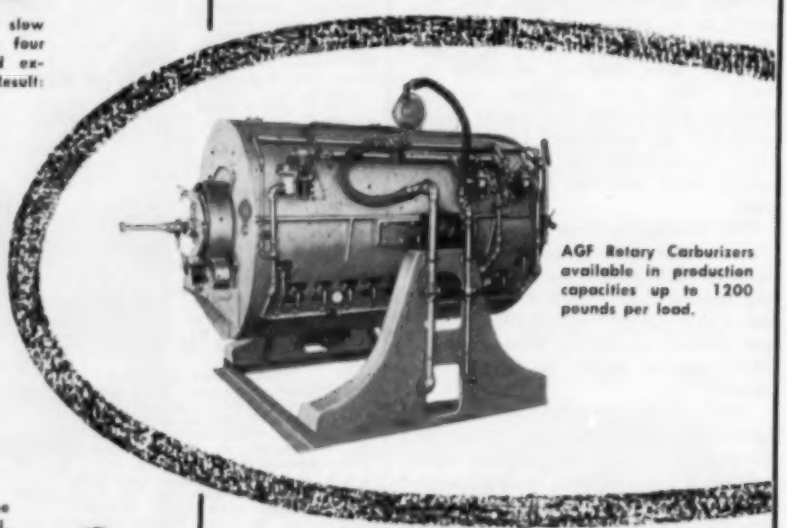

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MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.3c for max 0.15% C grade from above prices, 3c for max. 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, le' ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered, Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: .Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 29.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload lump, bulk, C 0.025% max. (Simplex 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered, Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 3-3.5% max, C 0.5-1% max) $3.10. **Primes and High Speed Grades** (V 50-55%, Si 1.50% max C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 65c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.25 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Aisifer. (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.25c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.2c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching, Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.95c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.
(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.03, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 5% max, C 0.4% max). Contract, ton lot, 3" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotitanium—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 3" x D, $6.25 per lb of contained Cb plus Ta., deld.; less ton lots $6.30.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c pel lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ¼" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%), C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

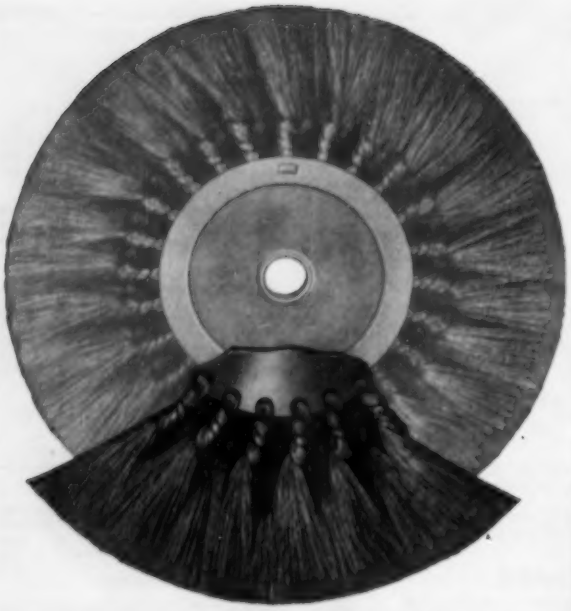
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington Pa., $1.24.



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Rock Co. Inc., Napa, Calif. Kaiser and Basalt have had a working agreement for more than six years, with Basalt using Kaiser plates in its pipe fabricating. Basalt has two modern steel fabrication plants—one in Napa and one at Fontana, near Los Angeles. Other operations of Basalt, primarily in the field of concrete aggregates, will not be affected by the purchase.

Iron Ore . . .

Iron Ore Prices, Page 135

The Great Lakes fleet hauled 2,044,959 gross tons of iron ore to lower lake ports in the week ended May 2, reports the Lake Superior Iron Ore Association. This compares with 1,137,625 tons brought down in the like week of the 1954 shipping season. Shipments in the 1955 season stand at 4,116,371 tons. This is 2,269,012 tons ahead of shipments up to May 2 in the 1954 season. During April, the fleet moved 3,758,006 tons, against 1,524,702 a year ago.

European interests are reported planning a major movement of iron ore from Texada Island, B. C. It is said five freighters already have been chartered at $9.50 a long ton, free loading and discharge. The port of discharge is not stated. The Texada mines have shipped about 1 million tons of ore to Japan in recent years.

Pig Iron . . .

Pig Iron Prices, Page 129

Pig iron business in most districts is rising gradually. Trading in April was slightly better than in March, and prospects for May are reasonably encouraging. However, the situation is still far from active.

Midwest foundries have been experiencing a pickup in order volume during the last two months, and they have increased melting operations proportionately. However, with vacation closings approaching, they are holding their inventories of pig iron to a minimum.

Demand has leveled off in New England. Most users are operating short-term schedules on spot incoming orders without maintaining substantial order backlogs. Basic melt is slightly heavier: Steel foundries are doing 5 to 10 per cent better than they did last year; those making heat-resistant castings, alloys and stainless, somewhat higher. Business of the leading producer of large steel and alloy valves lags slightly below that recorded in the first four months of last year.

In the St. Louis district, demand is declining owing to slack foundry business. Steel foundries in the area, many of them predominantly railroad suppliers, continue on a three or four-day week.

Imports are light on the East Coast, although 400 tons of Spanish iron were received recently by a northern New Jersey consumer against an old order.

Youngstown Sheet & Tube Co. lighted its Hubbard, O., blast furnace which had been out of blast more than 15 months. This will give the company more hot metal for its Campbell and Brier Hill Works.

Structural Shapes . . .

Structural Shape Prices, Page 124

Structural fabricators' prices are reported stiffening, reflecting in part the expectation that shape prices will go higher in the third quarter as the result of a steel wage increase.

In general, the seasonal improvement in demand for structurals continues. Public construction of all kinds, including highwaywork, is being added to materially by a steady flow of industrial and commercial building on private account.

Eastern fabricators report demand still spotty. However, more tonnage is under contemplation in the area and prospects are definitely better than they were a few weeks ago. New inquiry is featured by substantial thruway work in the western part of New York.

New structural projects up for early bidding in the Pacific Northwest include Tacoma's county-city building, involving about 700 tons, and an equal tonnage for the proposed Owens-Illinois Glass Co. factory and warehouse at Portland, Oreg. Alaskan military installations will require substantial tonnages. Fabricating plants in the area are reported holding backlogs extending six months. Competition is keen, however, for all new projects that appear.

Supply continues to tighten at all points, with little shape tonnage available for delivery before August. The pinch is especially noticeable in the wide flange sections.

The largest contract for fabricated structural steel in New England involves 17,300 tons of tunnel frames for the Central artery, Boston. It went to Bethlehem Steel Co. at $3,591,265, fabricated and delivered. The second on direct bids was American Bridge Division, U. S. Steel Corp., Pittsburgh, at $3,742,289, with the Ernst Construction Co., Buffalo, third at $4,383,909.

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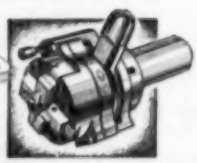

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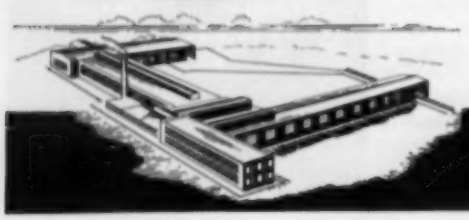

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Scrap . . .

Scrap Prices, Page 142

Philadelphia—The scrap market is sagging. Prices on several leading steel grades are down. In the cast iron grades, heavy breakable prices are easy, though unchanged.

Despite high mill operations, most leading consumers are in a comfortable position, with supplies moving fairly freely.

Largest recent purchases were by the Fairless, Pa., consumer, involving perhaps 15,000 to 20,000 tons. This mill dropped its price to $36.50, delivered, on the No. 1 grades—heavy melting, bundles and busheling. However, it paid higher than previously for No. 2 bundles ($29). No. 2 heavy melting was involved in the purchase, although the market on that grade is down to $33, delivered.

Despite the $36.50 paid by Fairless on No. 1 bundles and No. 1 busheling, the market on these grades holds at a spread of $36.50-$37.50, delivered. No. 1 heavy melting, however, is holding at the flat $36.50 level.

Prices on No. 2 bundles cover a wide spread of $27-$29, delivered. Electric furnace bundles are off to $39.50; machine shop turnings and mixed borings and turnings to $21.50; and short shovel turnings to $24. Structurals and plate are lower at $40-$41, delivered; couplers, springs and wheels at $42; and rail crops at $51-$52.

Export shipments were interrupted here last week by a port strike.

Cleveland—Steelmaking grades of scrap are off $2 a ton here, reflecting a sale in the Valley at a top price of $35. The mills are virtually out of the market here. The combination of large use of hot metal, substantial mill inventories and heavy flow of tonnage to the market serves to depress dealer prices. Despite high level steel operations, scrap is accumulating in dealers' yards, notably No. 2 bundles which are practically a drug on the market.

Cincinnati—A moderate tonnage of scrap was purchased last week by the local mill at prices $1 to $1.50 below previous levels. This resulted in the No. 1 grades dropping $1.50 to $31.50-$32.50. No. 2 heavy melting fell $1 to $28.50-$29.50. No. 2 bundles declined $1.50 to $22.50-$23.50. Machine shop turnings and short shoveling turnings remained steady, but mixed borings and turnings went down $1.50 to $17.50-$18.50. No. 1 railroad heavy melting declined $2.50 to $32.50-$33.50.

Boston—Steel scrap prices are lower, with new buying light. The reaction in the market, however, is orderly. For export, prices paid at dock are off, but for domestic consumption, top grade No. 1 steel is resisting the downtrend. This grade commands $32.50 dock. No. 2 bundles are off $1.50 a ton.

New York—Brokers' buying prices on No. 2 bundles are off to $23-$24. Other melting steel grades are steady, owing primarily to strength in the export market. Prices on machine shop turnings, mixed borings and short turnings and low phos are unchanged. Cast grades also are steady.

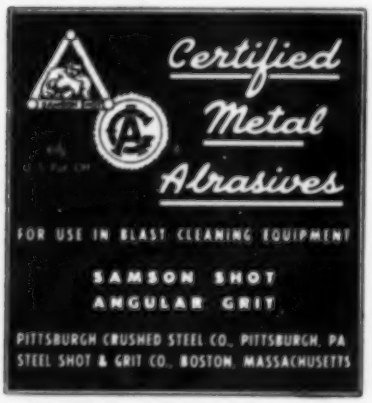
Buffalo—Easier tendencies prevail in the local scrap market. The leading mill consumer made substantial purchases of steelmaking grades at price declines of $1.50 a ton. Despite a high ingot rate, new business and lower prices reflected huge reserve stocks in millyards and anticipated large receipts by water from the eastern seaboard and Midwest points.

Detroit—One local consumer came into the market last week for open-hearth grades at $2 per ton below the previous purchase. No. 1 heavy melting is quoted at $27.50; No. 2 heavy melting, $21; No. 1 bundles, $27.50; and No. 1 busheling, $27.50. District steel ingot operations are estimated at 91.3 per cent of capacity, compared with 92 the preceding week and 63 a year ago.

Birmingham — Although electric furnace and specialty steel scrap items are strong, weakness has appeared in blast-furnace grades. Brokers predict the next mill purchases will be at lower prices. Firm prices prevail on the cast grades.

St. Louis—Prices are holding firm despite good outside shipments and generally plentiful supplies. Brokers note that the last time mills operated at 100 per cent of capacity, scrap was scarce. Mills now are taking all the material they can get

(Please turn to page 144)



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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

May 4	$35.33
Apr. 27	36.00
April Avg.	36.73
May 1954	28.00
May 1950	33.82

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	32.00-33.00
No. 1 bundles	35.00-36.00
No. 2 bundles	27.00-28.00
No. 1 busheling	35.00-36.00
Machine shop turnings	21.00-22.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	*24.00-25.00*
Cast iron borings	*24.00-25.00*
Cut structurals, 5 ft lengths	*39.00-40.00*
Heavy turnings	34.00-35.00
Punchings & plate scrap	*39.00-40.00*
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	33.00-34.00
Heavy breakable cast	33.00-34.00
Unstripped motor blocks	23.00-23.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	*37.50-38.50*
Rails, 2 ft and under	*48.00-49.00*
Rails, 18 in. and under	*49.00-50.00*
Rails, random lengths	*44.00-45.00*
Railroad specialties	*43.00-44.00*

Stainless Steel Scrap

18-8 bundles & solids	210.00-220.00
18-8 turnings	105.00-110.00
430 bundles & solids	95.00-100.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	*21.00-24.00*
No. 1 busheling	*31.00-32.00*
Machine shop turnings	*14.00-15.00*
Mixed borings, turnings	*21.00-22.00*
Short shovel turnings	*21.00-22.00*
Cast iron borings	*21.00-22.00*
Low phos.	33.00-34.00
Cut structural plates 2 ft and under	*17.00-18.00*
Alloy free, short shovel turnings	26.50-27.50
Electric furnace bundles	*31.00-32.00*

Cast Iron Grades

No. 1 cupola	*41.00-42.00*
Charging box cast	*35.00-36.00*
Stove plate	*41.00-42.00*
Heavy breakable cast	*31.00-32.00*
Unstripped motor blocks	*25.00-26.00*
Brake shoes	*30.00-31.00*
Clean auto cast	*43.00-44.00*
No. 1 wheels	*41.00-42.00*
Burnt cast	*31.00-32.00*
Drop broken machinery	*44.00-45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*34.00-35.00*
R.R. malleable	*43.00-44.00*
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Rails, random lengths	45.00-46.00
Cast steel	39.00-40.00
Railroad specialties	39.00-40.00
Uncut tires	41.00-42.00
Angles, splice bars	46.00-47.00
Rails, rerolling	52.00-53.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	*200.00-210.00*
18-8 turnings	*100.00-110.00*
430 clips, bundles, solids	*90.00-100.00*
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*34.00-35.00*
Machine shop turnings	*16.00-17.00*
Short shovel turnings	*23.00-24.00*
Cast iron borings	*23.00-24.00*
Low phos.	35.00-36.00
Electric furnace bundles	*34.00-35.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*35.00-36.00*

CHICAGO

No. 1 heavy melting	*33.00-35.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 factory bundles	*35.00-36.00*
No. 1 dealer bundles	*33.00-35.00*
No. 2 bundles	24.00-25.00
No. 1 busheling	35.00-37.00
Machine shop turnings	*16.50-17.50*
Mixed borings, turnings	*18.50-19.50*
Short shovel turnings	*18.50-19.50*
Cast iron borings	*18.50-19.50*
Cut structurals, 3 ft	*36.00-37.00*
Punchings & plate scrap	*37.00-38.00*
Electric furnace bundles	*35.00-36.00*

Cast Iron Grades

No. 1 cupola	40.00-41.00
Stove plate	35.00-36.00
Unstripped motor blocks	29.00-30.00
Clean auto cast	45.00-46.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-38.00*
R.R. malleable	46.00-47.00
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Angles, splice bars	44.00-45.00
Rails, rerolling	52.00-53.00

Stainless Steel Scrap

18-8 bundles & solids	220.00-225.00
18-8 turnings	95.00-100.00
430 bundles & solids	106.00-110.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange
(Week ended May 4)

	No. 1 Heavy Melting		
	High	Low	Close
Oct.	....	....	37.50*
Jan.	....	....	....

Sales (160-ton units): None.
*Nominal

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*27.50*
No. 2 heavy melting	*21.00*
No. 1 bundles	*27.50*
No. 2 bundles	20.00
No. 1 busheling	*27.50*
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	17.50
Punchings & plate scrap	34.00

Cast Iron Grades

Charging box cast	38.50
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	17.00-18.00
Short shovel turnings	25.00-26.00
Machine shop turnings	*19.00-20.00*
Electric furnace bundles	32.00-33.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	36.00-37.00
Structural plate, 2 ft	36.00-37.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 18 in. and under	*45.00-46.00*
Rails, rerolling	43.00-44.00
Rails, random lengths	*42.00-43.00*
Angles, splice bars	*43.00-44.00*
Stand. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting	*36.50*
No. 2 heavy melting	*32.50*
No. 1 bundles	*36.50-37.50*
No. 2 bundles	*27.00-29.00*
No. 1 busheling	*36.50-37.50*
Electric furnace bundles	*39.50*
Machine shop turnings	*21.50*
Mixed borings, turnings	*21.50*
Short shovel turnings	*24.00*
Structurals & plate	*40.00-41.00*
Heavy turnings	34.00-35.00
Couplers, springs, wheels	*42.00*
Rail crops, 2 ft & under	*51.00-52.00*

Cast Iron Grades

No. 1 cupola	37.00-38.00
Malleable	44.00
Heavy breakable cast	41.00
Drop broken machinery	44.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	32.00-32.50
No. 2 heavy melting	28.00-28.50
No. 1 bundles	32.00-32.50
No. 2 bundles	*23.00-24.00*
Machine shop turnings	12.00-13.00
Mixed borings, short turnings	14.00-15.00
Short shovel turnings	15.00-16.00
Low phos. (structural & plate)	34.00-35.00

Cast Iron Grades

No. 1 cupola	32.00-33.00
Unstripped motor blocks	22.00-23.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	210.00-235.00
18-8 borings, turnings	100.00-105.00
430 sheets, clips, solids	85.00-90.00
410 sheets, clips, solids	70.00-75.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	22.00-23.00
No. 1 bundles	*27.50-28.50*
No. 2 bundles	*16.00-17.00*
Machine shop turnings	12.00-12.50
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*15.50-16.50*
No. 1 cast	30.00-31.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	33.00-34.00

BUFFALO

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*30.00-31.00*
Mixed borings, turnings	20.50-21.50
Machine shop turnings	19.00-20.00
Short shovel turnings	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	36.00-37.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	37.00-38.00
No. 1 machinery	42.00-43.00

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*31.50-32.50*
No. 2 heavy melting	*28.50-29.50*
No. 1 bundles	*31.50-32.50*
No. 2 bundles	*22.50-23.50*
No. 1 busheling	*31.50-32.50*
Machine shop turnings	19.00-20.00
Mixed borings, turnings	*17.50-18.50*
Short shovel turnings	22.00-23.00
Cast iron borings	*17.50-18.50*
Low phos., 18-in.	38.00-39.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Heavy breakable cast	35.00
Charging box cast	36.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*32.50-33.50*
Rails, 18-in. and under	48.00-49.00
Rails, random lengths	40.00-41.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	31.00
No. 2 heavy melting	29.00
No. 1 bundles	31.00
No. 2 bundles	24.50
Machine shop turnings	*16.00*
Short shovel turnings	*18.00*

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	33.00
Heavy breakable cast	33.00
Unstripped motor blocks	33.00
Brake shoes	32.00
Clean auto cast	42.00
Stove plate	*34.00*

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Rails, 18-in. and under	46.00
Rails, random lengths	40.00-41.00
Rails, rerolling	50.00
Angles, splice bars	41.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	25.00
No. 2 bundles	23.00
No. 3 bundles	16.00
Machine shop turnings	12.00-14.00
Mixed borings, turnings	12.00-14.00
Short shovel turnings	12.00-14.00
Electric furnace, No. 1	35.00-37.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	36.00-40.00
Heavy breakable cast	28.00
Unstripped motor blocks	30.00-32.00
No. 1 wheels	21.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap
(Delivered consumer's plant)

Rails, random lengths	30.00-34.00

LOS ANGELES

No. 1 heavy melting	28.00
No. 2 heavy melting	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings	8.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	*30.00*
No. 2 heavy melting	*28.00*
No. 1 bundles	*29.00*
No. 2 bundles	*25.00*
No. 1 busheling	*30.00*
Machine shop turnings	*10.00-11.00*
Mixed borings, turnings	*10.00-11.00*
Short shovel turnings	*12.00*
Cast iron borings	*12.00*
Cut structurals	*30.00*
Heavy turnings	*11.00*
Punchings & plate scrap	*30.00*

Cast Iron Grades

No. 1 cupola	40.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	33.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Mixed borings, turnings	16.00
Rails, remelting	43.00
Busheling, new factory: Prepared	32.00
Unprepared	28.00
Short steel turnings	16.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

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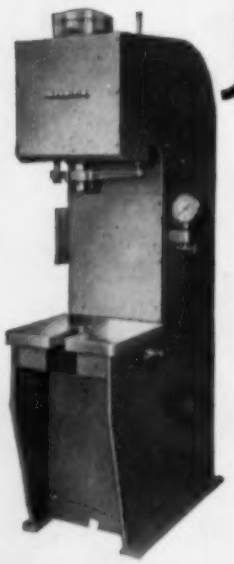

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(Concluded from page 141)

at current prices, but are wary of bidding the market up. A price change in railroad scrap, possibly reflecting a drop of $2 per ton in Chicago, was expected here when the Cotton Belt offered a diversified list of 16 items.

Chicago—Several important grades of steelmaking scrap are off $1 a ton, to continue the weaker market trend. A leading mill announced its May buying prices on No. 1 industrial heavy melting, No. 1 factory bundles and electric furnace material at $1 less than previous purchases. Other mills have bought No. 2 heavy melting and No. 1 railroad heavy melting for $1 less than formerly quoted. It is difficult to figure the softer market tone at a time when new weekly ingot tonnage records are being set.

Washington — Governmental regulations and economics of the world market make it impossible for exported scrap to find its way behind the Iron Curtain. That's the comment of the Institute of Scrap Iron & Steel following a request by Sen. Olin D. Johnston (Dem., S. C.) for an investigation of the export situation.

All applications for scrap export licenses to destinations other than western hemisphere countries require certified documentary evidence that the exported material will not be transhipped from the country of destination.

The Institute maintains it is unlikely the six Schuman Plan (western Europe) countries, which take 40 per cent of American scrap exports, will release any tonnage—considering the steel shortage abroad. The United Kingdom accounts for 15 per cent of American exports and also pools its buying, while the Japanese take about 20 per cent. It is inconceivable that they are trading with the Reds.

Other countries buying American scrap are the Argentine, Canada, Mexico and Spain. Russia never has been a factor in the world scrap market.

Los Angeles—Mill buying is limited largely to specialty grades of scrap. Some electric furnace material, however, also is moving.

San Francisco—Steel scrap prices have advanced $2 to $3 a ton, with the top increase on the best grades. Mill operations here have stepped up surprisingly fast in recent weeks, with a corresponding increase in scrap consumption. Cast iron grades are firm.

Seattle—One large mill is still paying $33 and $29 for No. 1 and No. 2 heavy melting steel, respectively, but dealers report prices generally are

off $2 to $31 and $27, with supplies adequate for current increased mill consumption.

Recent full cargo charters for scrap include May-June, Los Angeles loading, Japan discharge, at $142,000, free loading and discharge. Another cargo, steel shavings, Los Angeles to Antwerp-Rotterdam, early June loading, is valued at $161,000, free in and out. Ships will carry 9000 to 10,000 tons each.

Bankers Life & Casualty Co., Chicago, successful bidder for about 35,000 tons of used equipment and steel scrap in the Aleutian Islands, has asked governmental permission to bring in 250 Japanese laborers for a period of 200 days to assemble and ship the material. It is claimed American labor is not available. Immigration officials will not issue the permit unless qualified American labor is not at hand. Union officials strongly oppose importation of laborers.

The material is intended for export to Japan. However, assembling and loading it into ships in unsheltered areas is difficult.

Semifinished Steel . . .

Semifinished Prices, Page 124

Bethlehem Pacific Coast Steel Corp., San Francisco, last week placed a third 75-ton, open-hearth furnace in operation, boosting its operating rate to 80 per cent of capacity, the highest this year. Sixty employees were recalled.

Rails, Cars . . .

Track Material Prices, Page 127

The Greenville Steel Car Co., Greenville, Pa., has booked an order from the Bessemer & Lake Erie railroad for heavy repairs on 250 of its 70-ton, twin-hopper cars. The job involves repairs from the underframes up. Work begins in August.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2150 tons, plant construction, P. H. Glatfelter Co., Spring Grove, Pa., to Belmont Iron Works, Eddystone, Pa.

800 tons, 17-story apartment, Peter Doelger Inc., 72nd St. and 2nd Ave., New York, to Harris Structural Steel Co., that city.

780 tons, roof supports, turnpike tunnel, Lehigh and Carbon counties, Pa., through Lipsett, to the Commercial Shearing & Stamping Co.

750 tons, factory building, Armstrong Cork Co., Millville, N. J., to Max Corchin & Son, Philadelphia.

600 tons, Pacific Federal Savings & Loan Bank building, Portland, Oreg., to Pacific Car & Foundry Co., Seattle.

409 tons, high school, Shamokin, Pa., to Anthracite Bridge Co., Scranton, Pa.

380 tons, dormitory and Packer Hall addition, Lehigh University, Bethlehem, Pa., to Bethlehem Fabricators, that city.

200 tons, five radome installations, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Puget Sound-Drake, general contractor.

170 tons, warehouse and shop buildings, Air Force base, Portsmouth, N. H., to United Structural Steel Co., Worcester, Mass.; Granger Contracting Co., Worcester, general contractor.

STRUCTURAL STEEL PENDING

4265 tons, Iroquois dam, near Point Rockaway, St. Lawrence county; also 2900 tons, steel sheet piling for cofferdams; bids May 26, New York State Power Authority, New York; contract also includes erection, 6630 tons, gates and guides, and 900 tons, gantry cranes.

2215 tons, 12 bridges, Massachusetts turnpike, Hopkinton-Westboro-Ashland-Framingham, Mass.; bids May 10, Boston.

2015 tons, seven bridges, Palmer, Mass., Massachusetts turnpike; Berlanti Construction Co. Inc., Harrison, N. Y., low on general contract.

995 tons, state bridgework, Camden county, N. J., bids May 17; 431 tons of reinforcing steel also required.

750 tons, two 3-span and one 5-span stringer bridges, Canton-Dedham-Westwood, Mass., bids May 10, State Department of Public Works, Boston; also 340 tons, reinforcing bars.

700 tons, factory and warehouse, Owens-Illinois Glass Co., Portland, Oreg.; bids to Oakland, Calif., headquarters, May 17.

700 tons, county-city building, Tacoma, Wash.; bids soon.

630 tons, state highway bridge, Aroostook river, Ft. Fairfield, Me., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Verrier Construction Co., Portland, Me., general contractor.

500 tons, three bridges, Massachusetts turnpike, Sturbridge, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Henley-Lundgren Co., Shrewsbury, Mass., general contractor.

435 tons, three three-span beam bridges, F. E. Everett turnpike, Concord, N. H.; bids in.

400 tons, two pumping plants, Hanford Works; general contract awarded Hoffman Construction Co., Portland, Oreg., low at $1,392,985.

210 tons, four state highway bridges, Dennis-Harwich-Brewster, Mass., bids May 10, Boston; also 100 tons, reinforcing bars.

180 tons, three single composite beams with skewspan bridges, Ansonia-Derby, Conn., bids May 23, Hartford, Conn.; also 175 tons, reinforcing bars.

105 tons, two 1-span, WF-beam bridges, Glover, Vt.

100 tons, two one-span WF beam bridges, Jamaica-Londonderry, Vt.

100 tons, two-span, WF-beam bridge, Shelburne, Vt.

Unstated, engineering test reactor, $10-million project by private investors; bids to Atomic Energy Commission, Idaho Falls, Idaho, July 1.

REINFORCING BARS . . .

REINFORCING BARS PLACED

775 tons, two bridges, Massachusetts turnpike, including Chicopee river, Ludlow-Wilbraham-Palmer, Mass., to Truscon Steel Division, Republic Steel Corp., Boston; Brunelli Construction Co., Southington, Conn., general contractor.

200 tons, West Valley School, Yakima, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Wall, Bartram & Sanford, Junction City, Oreg., general contractor.

110 tons, guardhouse, Ft. Lewis, Wash., to Northwest Steel Rolling Mills Inc., Seattle; Macdonald Building Co., Tacoma, Wash., general contractor.

REINFORCING BARS PENDING

18,730 tons, Barnhart Island power plant, St. Lawrence power project, near Massena, N. Y.; Savin Construction Co., Hartford, Conn., and Merritt-Chapman & Scott Corp., New York, low joint contractors.

3000 tons, also 1000 tons of plates and 500 tons of shapes; Tacoma, Wash., Mayfield

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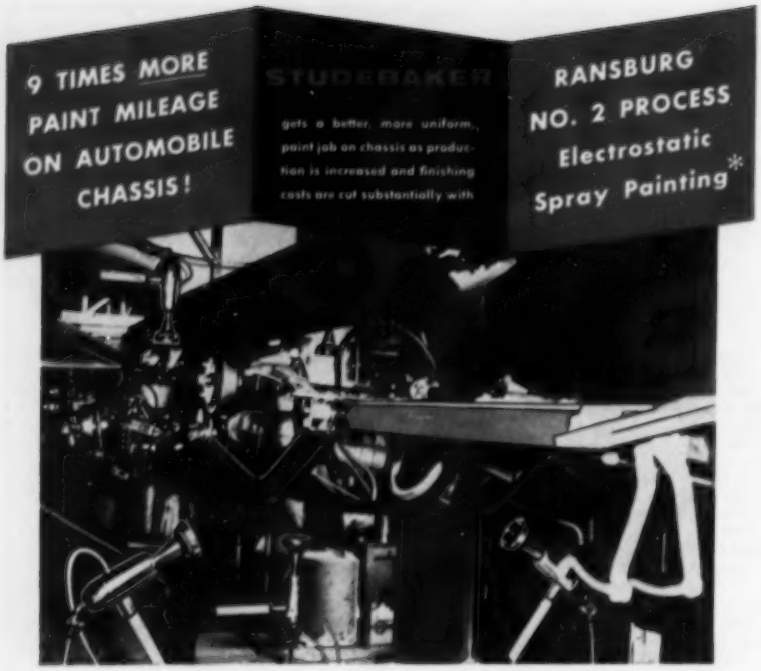

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RANSBURG

dam; bids postponed from May 27 to June 3.

1655 tons, 12 bridges, Massachusetts turnpike, Hopkinton-Westboro-Southboro-Ashland-Framingham, Mass.; bids May 10, Boston; also 25,300 linear feet of steel piling.

1045 tons, seven bridges, Massachusetts turnpike, Palmer, Mass.; Berlanti Construction Co., Harrison, N. Y., general contractor; also 25,000 linear feet of steel piling.

431 tons, state bridgework, Camden county, N. J., bids May 17; 995 tons of structurals also required.

215 tons, three bridges, Massachusetts turnpike, Sturbridge, Mass.; Henley-Lundgren Co., Shrewsbury, Mass., general contractor.

153 tons, Washington state, Spokane county, girder bridge; bids to Olympia, Wash., May 17.

100 tons or more, storage igloos, Great Falls, Mont.; general contract to Pappin Construction Co., Great Falls, low at $243,239 to U. S. Engineer, Seattle.

100 tons, Montana state highway bridge, Glacier county; general award to N. A. Nelson Construction Co., Sheridan, Wyo., low at $131,371.

Unstated, 5710 feet Utilidor construction, etc., Ladd Air Base, Alaska; S. S. Mullen Inc., Seattle, low at $1,512,893 to U. S. Engineer.

Unstated, waste crib, control structures, etc., Hanford Works; bids to Atomic Energy Commission, Richland, Wash., soon.

PLATES . . .

PLATES PLACED

1100 tons, large diameter caisson pipe, radar offshore tower, to Bethlehem Steel Co., Quincy, Mass., yard.

450 tons, seven fuel storage tanks, Adak, Alaska, Navy installation; to Hammond Iron Works, Provo, Utah; general contract to Raber & Kief, Seattle, low at $1,168,975.

220 tons, large diameter pipe, Massachusetts turnpike, near Springfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Brunelli Construction Co., Southington, Conn., general contractor.

PLATES PENDING

1700 tons, special treatment, dimpled; bids May 10, Navy Purchasing Office, Washington.

1515 tons, high tensile; Navy Purchasing Office, Washington, May 10.

125 tons, 300,000-gal. elevated water tank, Air Force base, near Glasgow, Mont.; bids to Corps of Engineers, Walla Walla, Wash.

Unstated, six Alaska military installations, fuel storage; bids in to U. S. Engineer, Seattle.

PIPE . . .

CAST IRON PIPE PENDING

200 tons, system extension, Yakima, Wash.; bids May 9.

STEEL PIPE PENDING

Unstated, approximately 1700 feet, 16 and 24-in. pipe for Hanford project; bids invited by Atomic Energy Commission, Richland, Wash.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Canadian National, one 2400-hp. general-purpose diesel locomotive to the Canadian Locomotive Co.

Northern Pacific, 38 diesel-electric units, with one 1600-hp road switcher going to Alco Products, New York, and twenty-five 1750-hp road switchers, two four-unit 7000-hp freight locomotives, three 1200-hp switchers and one 1750-hp freight unit, going to the Electro-Motive Division, General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

Canadian National, 20 baggage cars, to National Steel Car Corp.

RAILS PLACED

Boston & Maine, 2000 tons, to Bethlehem Steel Co., Bethlehem, Pa.

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Stainless steel brightwork (ask about it on the car *you* buy!) has much more than surface attractiveness. It has built-in, *timeless* beauty. Beauty that goes all the way through—doesn't scratch off or rust off. Beauty that lasts—outlives the car itself. And beauty that's practical . . . requires no weary polishing, just ordinary washing.

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Make it BETTER-and LONGER LASTING-with

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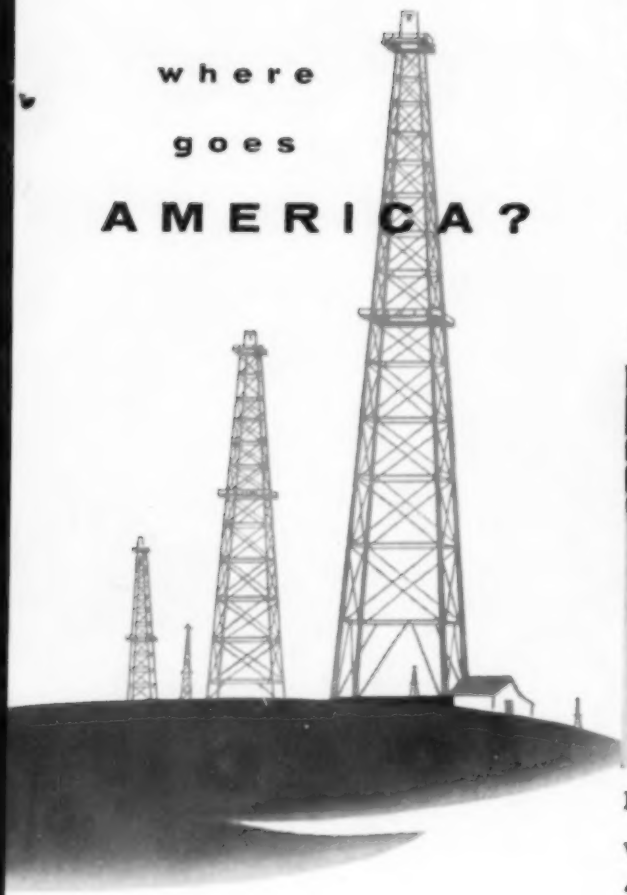

★ America goes after more and more oil and gas as demands increase . . . up about 5% in 1955. More wells will be drilled, an estimated 54,500. The average depth goes deeper, now down better than 4,000 feet. More and more pipe lines must be built . . . some 14,704 miles planned, approved or authorized. Every year more and more steel is required for production, processing and pipeline transportation per barrel of cubic foot of oil and gas.

All of this activity means more and more oil country goods and much of it will be seamless pipe and tubing.

Are your pipe and tube mills modernized or are you losing out competitively on quality or production?

Most of the ideas about making seamless tubing have been worked out between the steel industry and Aetna-Standard in 54 years association. Many new ideas are available from Aetna-Standard to make your pipe mills more productive. Or, if you are considering new facilities, Aetna has the facts on which to base an intelligent decision.

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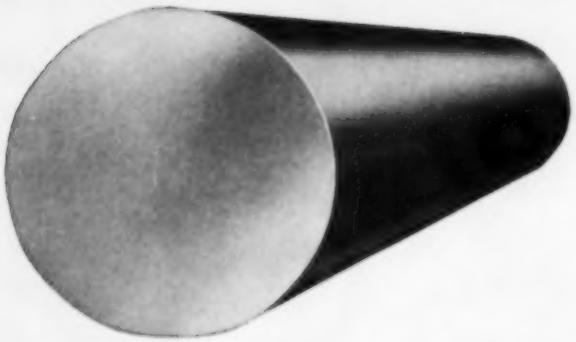
GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

When you make hollow parts . . .

Why use bar stock?



start with seamless tubing

Save steel, machining time!

WHY bore out bar stock to make hollow parts when Timken® seamless steel tubing lets you start production with the center hole already there? You don't waste steel and you save machining costs, too. Finish boring is often your first production step. Screw machine stations can be released for other jobs. So you add machining capacity without adding machines. And you save money because you pay only for the steel you use.

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